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CHARACTERISTICS OF JUNIOR COLLEGE STUDENTS IN OCCUPATIONALLY ORIENTED CURRICULA.

BY- STEWART, LAWRENCE H.
CALIFORNIA UNIV., BERKELEY, SCHOOL OF EDUC.

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TWO INVENTORIES (THE INTEREST ASSESSMENT SCALES AND SELECTED SCALES OF THE OMNIBUS PERSONALITY INVENTORY) AND A BACKGROUND QUESTIONNAIRE DEVELOPED AT THE UNIVERSITY OF CALIFORNIA AT BERKELEY WERE ADMINISTERED TO MALE AND FEMALE JUNIOR COLLEGE STUDENTS ENROLLED IN TRADE AND VOCATIONAL COURSES. AMONG THE NONCOGNITIVE VARIABLES COMPARED WERE SOURCES OF LIFE SATISFACTION (JOB, MARRIAGE, FAMILY, LEISURE, AND RELIGION), RISK TAKING ATTITUDES, IMPULSE EXPRESSION, ESTHETICISM, AND ABSTRACTION. MEANINGFUL PSYCHOLOGICAL FACTORS WERE FOUND TO BE RELATED TO THE CHOICE OF A VOCATIONAL PROGRAM IN A JUNIOR COLLEGE. THE STUDENTS ARE NOT SIMPLY AN AGGREGATE OF INDIVIDUALS WHO ARE IN VOCATIONAL PROGRAMS BECAUSE THEY HAVE BEEN UNSUCCESSFUL IN OTHER COURSES OR BECAUSE THEY HAVE BEEN JUDGED UNABLE TO COMPLETE AN ACADEMIC COURSE OF STUDY. THEY ARE DIFFERENT FROM THOSE JUNIOR COLLEGE STUDENTS WHO ARE IN NONVOCATIONAL PROGRAMS AND FROM STUDENT POPULATIONS IN 4-YEAR COLLEGES AND UNIVERSITIES. THIS INFORMATION IS CONSIDERED ESSENTIAL IN COUNSELING PROGRAM AND CURRICULUM PLANNING. (HS)

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RESEARCH AND DEVELOPMENT

IN

VOCATIONAL - TECHNICAL EDUCATION

CHARACTERISTICS OF JUNIOR COLLEGE STUDENTS IN OCCUPATIONALLY ORIENTED CURRICULA

REPORT NO. 1966-1

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CHARACTERISTICS OF

JUNIOR COLLEGE STUDENTS

IN OCCUPATIONALLY ORIENTED CURRICULA

Report No. 1966-1

Lawrence H. Stewart
Division of Counseling Psychology
School of Education
University of California, Berkeley

This is one of a number of studies of vocational-technical education in the high schools and junior colleges of Alameda and Contra Costa counties in California. These studies are financed by grants from the Vocational Education Section of the California State Department of Education and are under the direction of J. Chester Swanson.

School of Education, University of California
Berkeley, California
March 1966

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SIGNIFICANCE OF THE STUDY

Because of the accelerating rate of changes in skills required in the labor force, by the late 1970's the typical worker may expect to be "retreaded" as many as three times during his working years. As jobs change, he may have to modify his skills, or he may have to change his occupation altogether. The educational implications of these changes have been outlined in the report of the President's Panel of Consultants on Vocational Education.[1] In the next several decades, trade and technical training will become increasingly important in secondary and junior college curricula.

Through lack of one of the basic sources of information on which vocational curricula are based--information on characteristics of students--curriculum planners are handicapped at the present time in their efforts to develop meaningful programs of vocational training. Perusal of relevant literature indicates that there is a dearth of information about students enrolled in vocationally oriented courses; much of the available information is based on opinion rather than on actual research.

That vocational courses serve as "dumping grounds" for students who cannot hope to pursue a college curriculum is a commonly held opinion which may be based on fact in certain institutions. Stewart and Workman[2] cited an instance of one junior college faculty which felt strongly that only students who could not make grades high enough to transfer to a four-year institution should be placed in technical and trade courses. Conant[3] has expressed concern that poor students not be placed indiscriminately in vocational courses. He has suggested that students with IQ's below 90 not be placed in technical courses.

While the evidence concerning characteristics of vocational students is sketchy, it is sufficient to indicate that, in general, the impression that vocational courses are only dumping grounds for poor students is false. According to the National Association of Manufacturers, about 20 percent of those students who receive technical training continue their studies to become engineers and scientists. Clearly those students who continue their education must have superior academic ability. Medsker[4] provided some evidence that while junior college students enrolled in two-year programs had a somewhat lower mean score on the American Council of Education Psychological Examination than did students transferring to a four-year institution, the range of scores was as great for the terminal students. Thomte[5] reported

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[1] Panel of Consultants on Vocational Education, Education for a Changing World of Work. Washington: U. S. Government Printing Office, 1963.

[2] Stewart, L. H. with Workman, A. D., Mathematics and Science Competencies for Technicians. Sacramento: Bulletin of the Calif. State Dept. of Education XXIX, 1960.

[3] Conant, J. B., Education for the Atomic Age. New York: Colliers Encyclopedia, 1959.

[4] Medsker, L. L., The Junior College. New York: McGraw-Hill, 1960.

[5] Thomte, K. A., Certain characteristics of full time students enrolled in trade and industrial education classes in high schools and junior colleges of selected California communities. Unpublished doctoral dissertation, Univer. of California, Berkeley, 1961.

that while secondary and junior college students enrolled in trade and industrial classes fell predominantly in the IQ range of 90-109 (test not specified), the IQ's in his sample ranged from below 70 in the high school courses to over 130 for junior college students. Available evidence indicates a socio-economic bias in the choice of vocational courses. Clark[6] and Thomte[7] have shown that relatively more students in vocational courses come from low-status backgrounds than do students in transfer courses or in four-year institutions. Despite the existence of the above biases, it is evident that students in vocational courses are quite heterogeneous in terms of academic ability and socio-economic background.

Unfortunately, the studies reported to date deal only with vocational students in general. The present investigator was unable to locate any study concerned with differences in characteristics of students enrolled in various vocational curricula. If such differences do exist, then information relative to the nature of these differences would be essential to counselors who assist students in choosing programs of study and to curriculum committees who plan courses for these students.

From observation it appears that, with the exception of programs such as those designed for electronic technicians, little attention is given to criteria for admitting students to vocational courses. A student can enroll in a course of his choice as long as an opening exists. Lack of systematic admission procedures may have undesirable features both for the student and for the institution. Yet the lack of such procedures plus the heterogeneity of the student population provides unique conditions for studying relationships between certain student characteristics and the choice process. Under such conditions, do students with somewhat similar characteristics tend to concentrate in certain areas of study? Because students tend not to be screened, existing relationships between personal characteristics and the choice process should not be obscured by selection procedures.

The study described in this report is an initial phase of a comprehensive program of research with respect to the characteristics of vocational students. It is an attempt to discover variables which will be productive of further study with a representative sample of vocational students throughout the State of California and probably throughout the country.

The purpose of this study is to determine whether students enrolled in divers vocational programs in one institution can be differentiated in terms of non-cognitive variables within the interest and personality domains. Specifically, an attempt will be made to determine whether various curriculum groups can be differentiated in terms of the scales on the Interest Assessment Scales (IAS) and on the Omnibus Personality Inventory (OPI). Certain relationships between these two instruments will be examined.

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[6]Clark, B. R., The Open Door College. New York: McGraw-Hill, 1960.

[7]Thomte, K. A., op. cit.

The practical significance of this type of study has been suggested in the foregoing discussion. It has important theoretical implications as well. The findings of this study will provide information about the choice process at that end of the occupational continuum which has been ignored largely in research on vocational choice. Also, the findings will provide needed information bearing on the psychological continua underlying the various scales used in the study.

Darley and Hagenah[8] have suggested that high-level occupations, such as the professions, are intrinsically interesting and that persons tend to choose these occupations because the occupations are compatible with their interests. Low-level occupations, on the other hand, do not have this interest factor; therefore, individuals choose these occupations on some basis other than interest. Darley and Hagenah would not expect the lower-level occupations to be differentiated on the basis of interests.

Darley and Hagenah were referring to semi-skilled and unskilled occupations as low-level. Certainly many of the students in vocational courses will find employment at the skilled or sub-professional level. Yet a large number of the students enrolled in some of these courses will be employed at the semi-skilled level. Thus if Darley and Hagenah are correct, one would not expect to find students in vocational curricula, particularly those planning to enter semi-skilled occupations, to be sharply differentiated on the basis of interest scores. On the other hand, Clark[9] reported differences in the interests of Navy enlisted men in various specialties--a number of the specialties being of a semi-skilled nature. Clearly, further research is needed on the interest of individuals entering the so-called lower levels.

The inclusion of the OPI variables in the study was based on two considerations. 1) MacKay[10] found persistence of junior college students, both vocational and transfer, to be related to a measure of interpersonal maturity. Thus it appears that personality variables are related to the plans and decisions of junior college students. 2) The Center for the Study of Higher Education at Berkeley[11] has found the OPI to be useful in differentiating students enrolled in selected colleges and universities. Would the instrument also differentiate among students enrolled in the various vocational curricula?

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[8]Darley, J. G., & Hagenah, Theda, Vocational Interest Measurement. Minneapolis: Univer. of Minn. Press, 1955.

[9]Clark, K. E., Vocational Interests of Non-professional Men. Minneapolis: Univer. of Minn. Press, 1961.

[10]MacKay, W. R., Maturity of interpersonal perceptions and persistence of junior college students. Unpublished doctoral dissertation, Univer. of California, Berkeley, 1962.

[11]Center for the Study of Higher Education, Omnibus Personality Inventory. Berkeley: Univer. of Calif., 1962.

RESEARCH METHOD

Procedure

The Interest Assessment Scales and selected scales of the Omnibus Personality Inventory were administered to the male and female junior college students enrolled in trade and industrial courses along with a questionnaire designed to elicit background information and attitudes toward college. The instruments were administered during a three-hour laboratory period which is provided for all students in the various curricula. In some instances students were unable to complete all the instruments during the alotted time; these students completed the OPI outside of class and returned it to the investigator.

Information concerning academic achievement was obtained from the students' records. For some subjects, scores were available on the School and College Ability Test, Sequential Test of Education Progress (reading), Minnesota Paper Form Board, and Ravens Progressive Matrices. Data from the last three tests have not been analyzed in this report.

Subjects

The subjects were all obtained from one junior college located in the San Francisco Bay Area. The college is oriented primarily to trade and technical education.

Classes were tested as intact units. The only students not tested were those who were absent on the day their curriculum group was tested and those who had made no vocational commitment (as indicated by failure to enroll in a particular program). Because complete data were not available for certain students, not all subjects were included in certain analyses. In some instances, data were eliminated because they were either incorrect or incomplete. The subjects on which sufficient usable data were obtained are described in Table 1.

Instruments

The OPI was developed by the Center for the Study of Higher Education specifically for the study of student populations. Only seven of the nine scales were included in this study. The descriptions of these scales are adapted from the manual.[12]

Autonomy (Au). The characteristic measured is composed of nonauthoritarian thinking and a need for independence. High scorers are nonjudgmental, realistic, and intellectually liberal.

Complexity (Co). This measure reflects an experimental orientation. Persons high on this scale tend to seek out and to enjoy diversity and ambiguity.

Estheticism (Es). High scorers endorse statements indicating diverse interests in artistic matters and activities.

[12] Omnibus Personality Inventory, op. cit.

TABLE 1

Total Subjects Grouped According to Curriculum

Curriculum	Males	Females	Total
Aeronautics	29	--	29
Air Conditioning & Refrigeration	15	--	15
Automotive	59	--	59
Building & Construction	75	--	75
Business Equipment Technology	18	--	18
Cosmetology	--	8	8
Dental Assisting	--	52	52
Drafting	59	4	63
Dry Cleaning	--	3	3
Electrical	78	--	78
Fashion Arts	2	39	41
Graphic Arts	10	2	12
Housekeeping	--	4	4
Liberal Arts	2	2	4
Machine Technology	55	--	55
Medical Assisting	--	24	24
Photography	17	--	17
Shoe Rebuilding	8	--	8
Upholstery	14	1	15
Vocational Nursing	--	28	28
Total Subjects	441	167	608

Impulse Expression (IE). This scale assesses a general readiness to express impulses and to seek gratification either in conscious thought or in overt action. High scorers value sensations. Nine of the 75 items in this scale were omitted because they were objectionable to the school administration. This omission should be kept in mind in comparing the results with other studies using the scale.

Social Introversion (SI). High scorers withdraw from social contacts. Low scorers tend to seek social contacts and to gain satisfaction from them.

Thinking Introversion (TI). Persons scoring high on this scale are characterized by a liking for reflective thought, particularly of an abstract nature. Low scorers show a preference for overt action and tend to evaluate ideas on the basis of their immediate application.

Theoretical Orientation (TO). This scale measures interest in scientific activities. High scorers are generally logical, rational, and critical in their approach to problems.

A description of the Interest Assessment Scales has not yet appeared in print, and since the format of the instrument is quite different from that of other measures of interest, the scales will be described in considerable detail.

The IAS consists of eight a priori subtests. The subtests are revisions of twelve subtests described by Ronning, Stellwagen, and Stewart.[13] The eight subtests are as follows:

1. Adventure. A high score on this scale suggests a preference for activities of an adventurous and daring nature. These activities involve physical challenge and excitement.

2. Order. A high score on this scale indicates a preference for activities which can be dealt with in an orderly, systematic manner; an individual with a high score would probably enjoy situations where it is necessary to pay attention to detail. An example of a situation requiring such attention to detail might be writing programs for an electronic computer.

3. Influencing Others. A high score on this scale indicates a preference for activities through which one can influence others. Such influence might be expressed by being in a leadership position, by associating with important people, or by persuading others to carry out one's wishes.

4. Nurturance. A high score on this scale represents a preference for activities which demonstrate concern for the welfare of others--a desire to help the less fortunate.

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[13] Ronning, R. R., Stellwagen, W. R., & Stewart, L. H., Application of Multidimensional and Scale Analysis to Interest Measurement. Berkeley: Report, Cooperative Research Project 1493, U. S. Office of Education, 1963.

5. Concrete Means. A high score on this scale indicates a preference for activities designed to achieve rather concrete ends--to design, to build, or to operate something. These preferences represent an applied orientation to problems.

6. Written Expression. A high score on this scale represents a preference for situations or activities which permit one to express his ideas through writing. The major concern is written expression, not the enjoyment or evaluation of the literary works of others.

7. Abstract Ideas. A high score on this scale represents a preference for working with abstract ideas as opposed to the concrete application of ideas in Scale 5. A person with such a score might be relatively uninterested in the usefulness or the practical application of his ideas.

8. Aesthetic. A high score on this scale represents a preference for activities involving either the enjoyment of works of art or the production of such works.

Each subtest contains one item from each of ten item domains within which interests might be expected to vary and which are typically included in interest inventories. Examples of these domains are: characteristics of close associates, college majors, and activities of a government mission overseas. Thus each subtest consists of ten items.

Subjects were required to scale each item in a particular domain by an equisection procedure similar to that used by Gardner and Thompson[14] in the development of their Social Relations Scales. Consider the domain of college curricula as a paradigm. The subject was shown a normal curve pictograph and instructed to think of the pictograph as representing all college curricula with which he was acquainted. He was to consider the curricula as being normally distributed in terms of his preference. He was then instructed to anchor his preferences as follows:

Dislike Very Much	Halfway Between	Middle	Halfway Between	Like Very Much
___	___/___	___/___	___/___	X /___ ___

In the extreme right-hand box, he placed the name of the curriculum preferred over all others; in the extreme left-hand box, the one least liked; and so on until all boxes were filled.

The anchoring procedure constituted the first phase of the scaling. Then the eight items relating to college curricula were

[14]Gardner, E. F., & Thompson, G. G., Social Relations and Morale in Small Groups. New York: Appleton-Century-Crofts, 1956.

scaled relative to the continuum defined by a subject's anchors. Subjects were instructed to decide, in terms of their preference, in which half of the continuum an item belonged, in which quarter, and then to which box it was closer. The response to each item was marked as shown (X) below the boxes. A subject was completely free to place his response anywhere along the continuum. The entire procedure was repeated for each of the ten item domains.

In the event that a stimulus item was liked or disliked more than the extreme anchors, an extra space was provided at each end of the continuum. Thus each item could be rated along a 10-unit scale, ranging from "Less than dislike very much" to "More than like very much." Each subject was represented by a 10 x 8 matrix, $\underline{X}_s = (\underline{x}_{ijs})$, $\underline{i} = 1, 2, \ldots, 10$; $\underline{j} = 1, 2, \ldots, 8$; where $\underline{x}_{ijs}$ is the scale value for subject $\underline{s}$ on item $\underline{j}$ for domain $\underline{i}$.

The items in each of the item domains have test-retest reliabilities (canonical correlations) ranging from .82 to .87 over a five-week interval; so they are quite reliable. Evidence presented by Stewart and Ronning[15] indicates that the subtest scores are related to the vocational plans of subjects. Further evidence indicates that the subtests yield interval scales.

Analysis

For the basic findings described in this report, the data were analyzed by means of multivariate analysis of variance (MANOV), an extension of simple one-way analysis of variance. Two hypotheses are tested by the MANOV procedure. H_1 is the Wilks test[16] for equality of variance-covariance matrices. If the matrices of correlations for the various groups are similar (insignificant $\underline{F}$ ratio) then it can be assumed that the factor structure underlying the tests remains constant across groups. In other words the tests would present similar stimuli for the curriculum groups. A significant $\underline{F}$ test, on the other hand, would not mean necessarily that the factor structure underlying the tests would be different for the various curriculum groups as one might suspect. In this study, a nonsignificant $\underline{F}$ ratio is desired.

H_2 is a test of the hypothesis that the profiles of mean scores on the various instruments are different for the several curriculum groups. A significant $\underline{F}$ ratio would mean that the tests do differentiate the groups.

Canonical correlation was used for some of the analyses. Canonical analysis provides an estimate of the maximum possible

[15] Stewart, L. H., & Ronning, R. R., Multidimensional Analysis of an Experimental Measure of Interest. Cooperative Research Project No. 2209, U.S.O.E., 1964.

[16] Wilks, S. S., Sample criteria for testing equality of means, equality of variances, and equality of covariances in a normal multivariate distribution. Ann. Math. Statist., 1946, 17, 257-281.

relationship between linear composites of two sets of multivariate data. Specific applications of canonical analysis will be described as appropriate along with the findings.

FINDINGS

Omnibus Personality Inventory (OPI)

Comparison of Study Sample Scores with Published Norms. How similar is the study sample to other groups of college students with respect to the OPI variables? While the comparison group is not entirely appropriate, the mean scores of the men and of the women in the study sample were compared with the norms in the OPI Manual. (A more appropriate comparison would have been with the means of other junior college samples.) The OPI norms are based on 2,390 college freshmen from the University of California, Berkeley, and San Francisco State College. The comparisons are shown in Table 2. The study sample appears to be somewhat different on the OPI variables from freshmen in four-year institutions. Therefore, the findings of this study probably should not be generalized to other college populations.

Sex. The mean scores on the OPI variables, grouped according to sex, were analyzed by multivariate analysis of variance (MANOV) procedures. The results are shown in Table 3. Sex differences in profiles of mean scores were significant well beyond the .01 level. Therefore, all subsequent analyses involving the OPI were made separately by sex.

Choice of Curriculum. The MANOV of the profiles of mean OPI scores, grouped according to area of study, are shown in Tables 4 and 5. Only six groups of males and four groups of females had sufficient numbers to justify including them in the analysis. For both males and females, the students in the various vocational courses were differentiated by mean OPI scores. In both cases, however, the F ratios were in the doubtful zone of significance ($.01 < p < .05$).

Plots of the mean OPI scores converted to standard scores are shown in Figures 1, 2, and 3. Most of the difference for males appears to be due to the fact that the mean scores of the electronic technicians tended to be quite discrepant from the other groups. These technicians tended to have higher mean scores on TI and TO, and somewhat lower mean scores on IE.

For women, the dental assistants and those in the fashion arts had almost identical profiles except for the SI scale. The dental assistants were more inclined to seek out personal contacts. The mean profile of medical assistants was quite similar to that of vocational nurses.

In all the MANOV analyses involving the OPI, the F ratio for H_1 was nonsignificant. This indicates that the factor structure underlying the OPI scales was similar for the sexes and for the curriculum groups.

TABLE 2

Mean Scores of Study Subjects Converted to Standard Scores
Based on Norm Groups

Scale	Males	Females
Au	44	43
Co	51	49
Es	43	51
IE*	--	--
SI	56	53
TI	42	44
TO	47	43

*No comparisons with published norms possible since the scale was shortened for the current study.

TABLE 3

MANOV of Profiles of Mean OPI Raw Scores
Grouped According to Sex

Scale	Mean Score for Males	Mean Score for Females
Au	19	18
Co	12	11
Es	8	12
IE	33	27
SI	26	23
TI	27	29
TO	17	15

$H_1 : F^{28}_{\infty} = .127 \qquad p > .05$

$H_2 : F^{7}_{392} = 21.06 \qquad p < .01$

TABLE 4

MANOV of OPI Raw Scores for Men
Grouped According to Vocational Curriculum

OPI Scale	Bldg. & Constr. (N=50)	Aero-nautics (N=25)	Auto-motive (N=40)	Drafting (N=39)	Electrical (N=43)	Machine Tech. (N=38)
Au	18	19	18	18	19	19
Co	12	11	11	11	13	12
Es	8	6	7	7	7	7
IE	33	34	34	32	31	34
SI	27	27	26	27	25	27
TI	26	25	25	26	30	26
TO	16	16	16	18	20	17

$H_1 : F_{\infty}^{140} = .223 \qquad p > .05$

$H_2 : F_{941}^{35} = 1.50 \qquad .01 < p < .05$

TABLE 5

MANOV of OPI Raw Scores for Women
Grouped According to Curriculum

OPI Scale	Medical Assistant (N=17)	Fashion Arts (N=23)	Dental Assistant (N=44)	Vocational Nursing (N=19)
Au	19	17	18	17
Co	10	12	12	9
Es	12	11	11	12
IE	24	29	29	23
SI	22	26	22	22
TI	31	28	28	30
TO	14	16	14	15

$H_1 : F_{\infty}^{84} = .160 \qquad p > .05$

$H_2 : F_{268}^{21} = 1.61 \qquad p = .05$

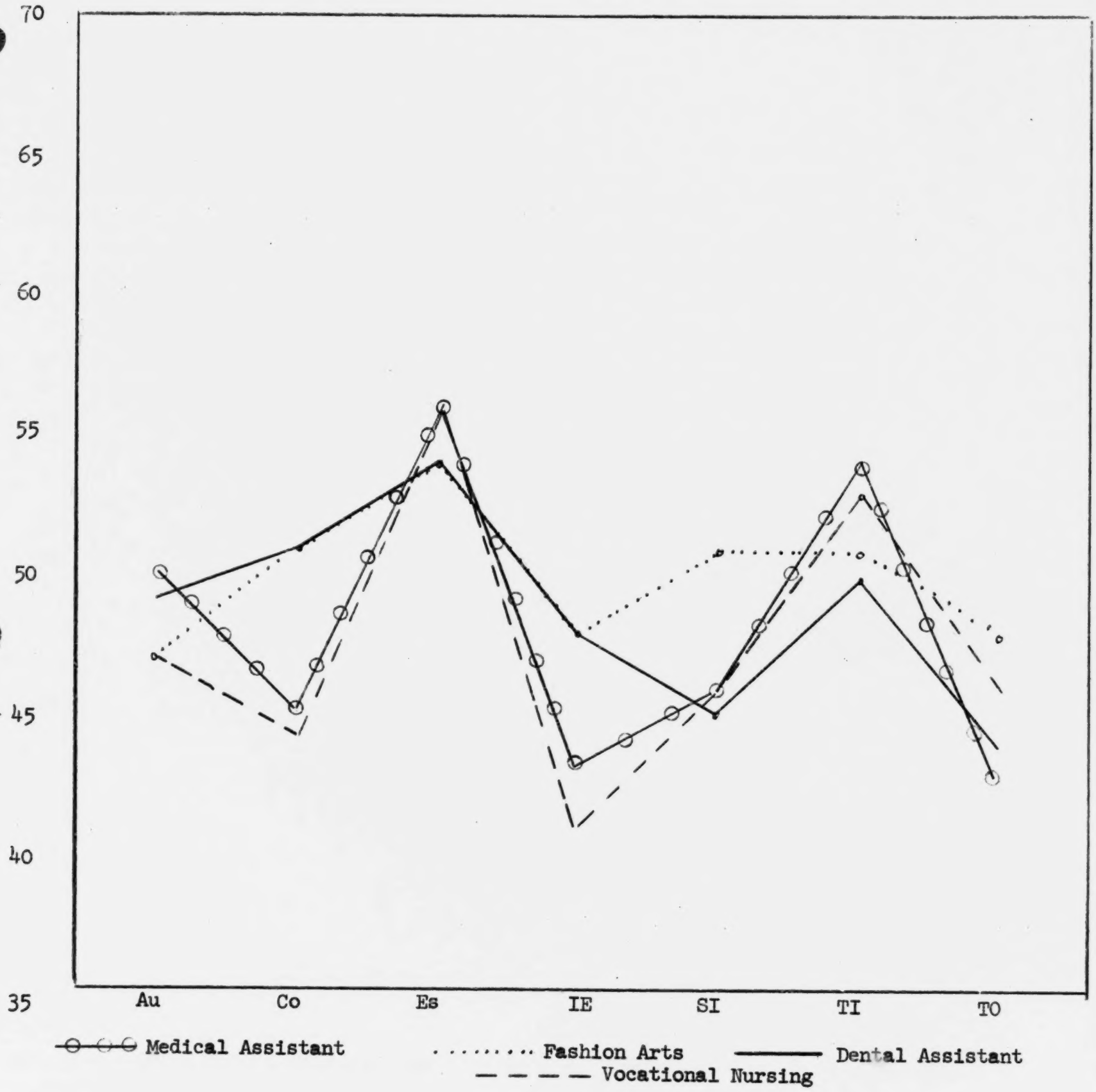

Fig. 1. Plots of profiles of mean OPI scores, converted to standard scores, for females grouped according to curriculum.

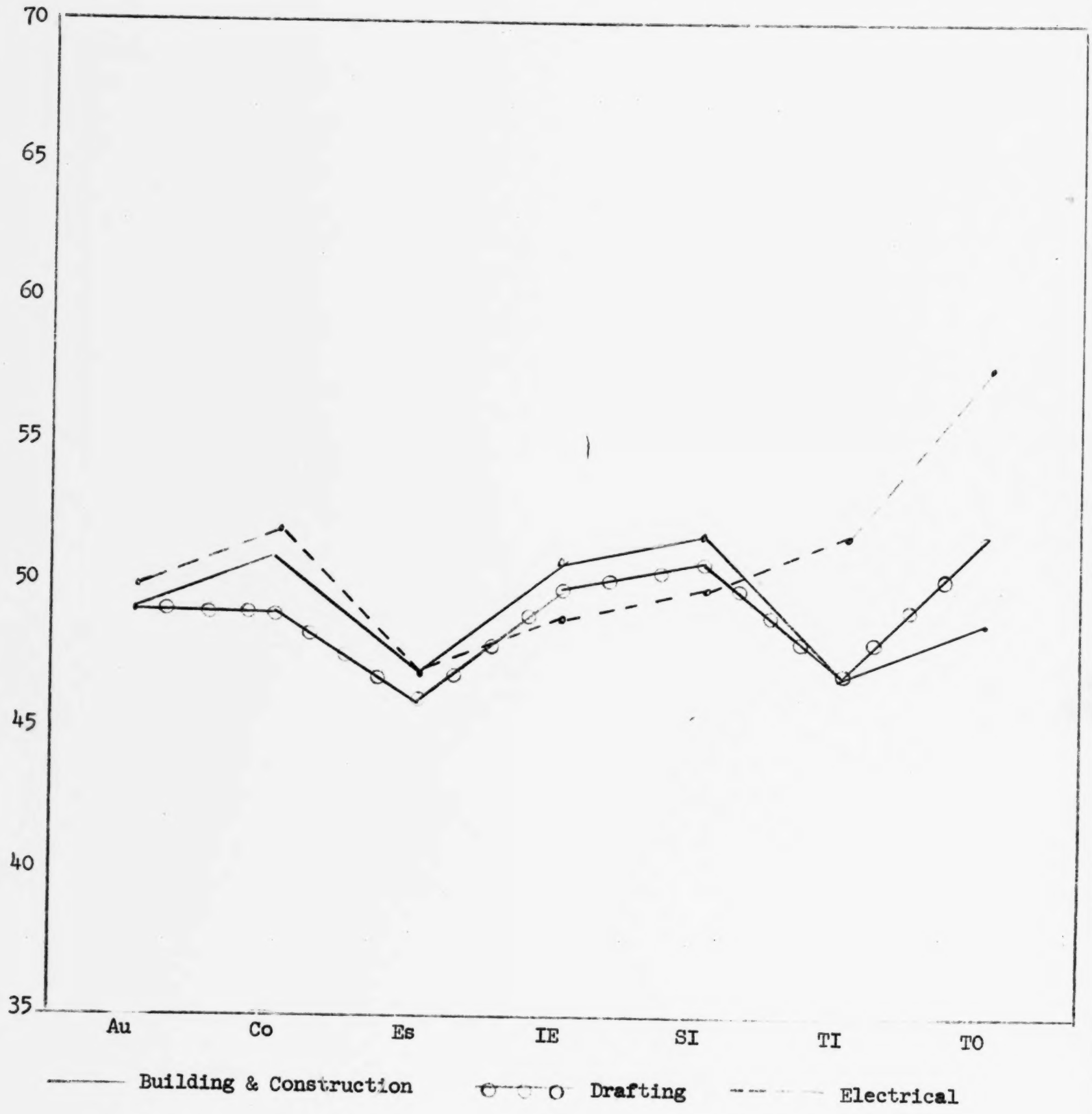

Fig. 2. Plots of profiles of mean OPI scores, converted to standard scores, for males in Building & Construction, Drafting, and Electrical curricula.

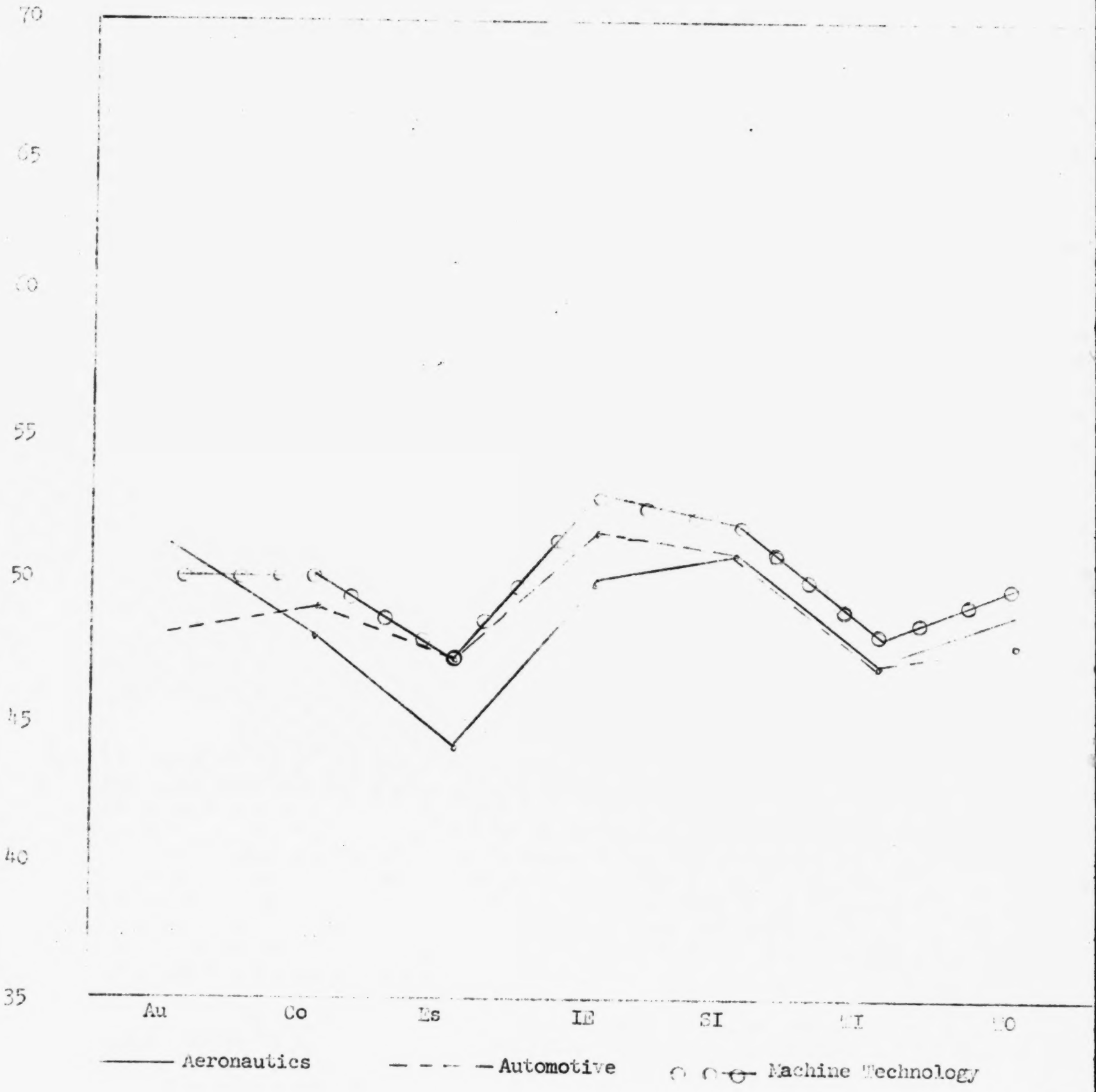

Fig. 3. Plots of profiles of mean OPI scores, converted to standard scores, for males in Aeronautics, Automotive, and Machine Technology curricula.

Interest Assessment Scales (IAS)

Comparison of Study Subjects with Other Junior College Students. IAS scores were available from a group of subjects probably more representative of junior college students than the present study sample--more representative in terms of enrollment in pre-professional courses and of plans to transfer to a four-year institution. The MANOV analyses for these two samples are shown in Tables 6 and 7.

For both males and females the differences between the mean vectors of IAS scores for the two samples were highly significant ($p < .01$). The male students from the study sample tended to have higher scores on Concrete Means and Aesthetic; lower on Influencing Others, Nurturance, and Written Expression. With two exceptions, differences between the two samples of women students are quite similar to those for the males. The differences on Concrete Means and on Aesthetic tended to disappear for the women.

Sex. The IAS scores of the vocational students were analyzed according to sex. The MANOV of the profiles of means is shown in Table 8. The F ratio for H_2 indicates that the IAS subtests distinguish sharply between males and females. Therefore, subsequent analyses were made separately by sex.

Perusal of Table 8 indicates that males tended to have higher scores than females on Adventure, Concrete Means, and Abstract Ideas; lower scores on Nurturance, Written Expression, and Aesthetic. Their scores were fairly close on Order and Influencing Others.

Curriculum. The analyses of IAS scores grouped according to course of study are shown in Tables 9 and 10. The MANOV of the means indicates that the IAS scores clearly differentiate curriculum groups for both sexes.

The profile of means in Tables 9 and 10, converted to standard scores, are plotted in Figures 4, 5, and 6. When compared with automotive and drafting students, electronic technicians appeared to be most deviant in IAS scores. The technicians had lower scores on Adventure, Order, Influencing Others, and Aesthetic. Their scores were higher on Abstract Ideas.

The profiles of students in machine technology and aeronautics appeared to be quite similar except on Written Expression. Aeronautics students were lower on that scale. Students in the construction trades scored relatively lower on Concrete Means than did those in aeronautics and machine technology.

The IAS profiles for medical assistants and vocational nurses were quite similar. The profiles of dental assistants and students in the fashion arts deviated from the first two groups and to some extent from each other. Dental assistants, while higher in Nurturance, tended to be lower in Order, Concrete Means, and Abstract Ideas than subjects enrolled in the fashion arts.

TABLE 6

MANOV of IAS Scores for Study Samples vs Comparison Sample -- Males

IAS Subtest	Comparison (N=149)	Study (N=285)
Adventure	58	56
Order	38	39
Influencing Others	49	43
Nurturance	48	43
Concrete Means	51	57
Written Expression	41	33
Abstract Ideas	52	49
Aesthetic	41	45

$H_1 : F^{36}_{\infty} = .410 \qquad p > .05$

$H_2 : F^{8}_{425} = 17.02 \qquad p < .01$

TABLE 7

MANOV of IAS Scores for Study Sample vs Comparison Sample -- Females

IAS Subtest	Comparison (N=133)	Study (N=115)
Adventure	50	49
Order	40	41
Influencing Others	48	44
Nurturance	60	57
Concrete Means	38	40
Written Expression	44	41
Abstract Ideas	46	43
Aesthetic	54	54

$H_1 : F^{36}_{\infty} = .311 \qquad p > .05$

$H_2 : F^{8}_{239} = 2.86 \qquad p < .01$

TABLE 8

MANOV of IAS Scores Grouped According to Sex

IAS Subtest	Males	Females
Adventure	56	49
Order	39	41
Influencing Others	43	44
Nurturance	43	57
Concrete Means	57	40
Written Expression	33	41
Abstract Ideas	49	43
Aesthetic	45	54

$H_1 : F^{36}_{\infty} = .294 \qquad p > .05$

$H_2 : F^{8}_{391} = 74.27 \qquad p < .01$

TABLE 9

MANOV of Mean IAS Scores for Males
Grouped According to Curriculum

IAS Scale*	Bldg. & Constr. (N=50)	Aero-nautics (N=25)	Auto-motive (N=40)	Drafting (N=39)	Electrical (N=43)	Machine Tech. (N=38)
1	57	60	58	55	51	58
2	38	42	39	40	37	38
3	43	44	44	45	40	41
4	46	42	44	42	41	43
5	54	63	56	53	60	61
6	31	30	33	33	31	36
7	47	49	46	49	55	48
8	46	46	44	47	39	42

$H_1 : F^{180}_{\infty} = .170 \qquad p > .05$

$H_2 : F^{40}_{970} = 2.03 \qquad p < .01$

*1 Adventure
2 Order
3 Influencing Others
4 Nurturance
5 Concrete Means
6 Written Expression
7 Abstract Ideas
8 Aesthetic

TABLE 10

MANOV of Mean IAS Scores for Females
Grouped According to Curriculum

IAS Scale	Medical Assistant (N=17)	Fashion Arts (N=23)	Dental Assistant (N=44)	Vocational Nursing (N=19)
Adventure	46	48	50	50
Order	43	42	36	48
Influencing Others	46	44	42	48
Nurturance	64	50	54	68
Concrete Means	38	45	35	44
Written Expression	42	37	40	49
Abstract Ideas	42	47	39	49
Aesthetic	49	59	53	55

$H_1 : F_{\infty}^{108} = .366$ $\quad p > .05$

$H_2 : F_{267}^{24} = 5.37$ $\quad p < .01$

TABLE 11

Intercorrelations Between Subtests of IAS and OPI*

	IAS Subtests								OPI Scales						
	1	2	3	4	5	6	7	8	Au	Co	Es	IE	SI	TI	TO
1		.17	.22	.24	.16	.09	.10	.07	-.19	-.09	-.09	.14	-.10	-.17	-.17
2	.07		.53	.52	.36	.51	.39	.24	-.28	-.31	-.31	-.25	-.09	-.08	-.05
3	.19	.53		.58	.25	.54	.42	.25	-.15	-.23	.16	-.15	-.33	.19	.04
4	.15	.36	.39		.25	.54	.34	.30	-.22	-.20	.18	-.18	-.22	.16	-.05
5	.25	.55	.38	.22		.14	.48	.06	-.12	-.18	-.14	-.12	-.12	.09	.15
6	.09	.27	.44	.33	.16		.54	.44	-.04	-.05	.38	-.14	-.29	.43	.17
7	.10	.42	.50	.25	.47	.53		.40	.10	.07	.31	-.13	-.20	.55	.49
8	.15	.12	.28	-.03	.16	.24	.36		.06	.05	.49	-.03	-.14	.30	.12
Au	.14	-.04	.00	.11	-.03	.04	.11	.20		.36	.24	.24	.00	.32	.27
Co	.25	-.16	.12	-.14	.06	.11	.28	.28	.31		.32	.54	.01	.33	.39
Es	.17	.05	.40	.09	.00	.52	.33	.44	.10	.37		.25	-.19	.59	.39
IE	.31	-.16	.18	-.12	.01	-.01	.11	.22	.20	.54	.33		.05	-.01	.07
SI	-.07	.01	-.25	-.12	.10	-.18	-.16	-.27	-.10	-.10	-.37	-.13		-.36	-.25
TI	.05	.16	.35	.24	.07	.56	.53	.34	.23	.33	.71	.10	-.41		.68
TO	.15	.18	.18	.08	.28	.24	.56	.16	.16	.29	.37	.15	-.21	.59	

*Correlations for 285 males appear above the diagonal; for 115 females, below the diagonal.

Level of correlation required for significance:

	.01	.05
Males	.154	.116
Females	.241	.184

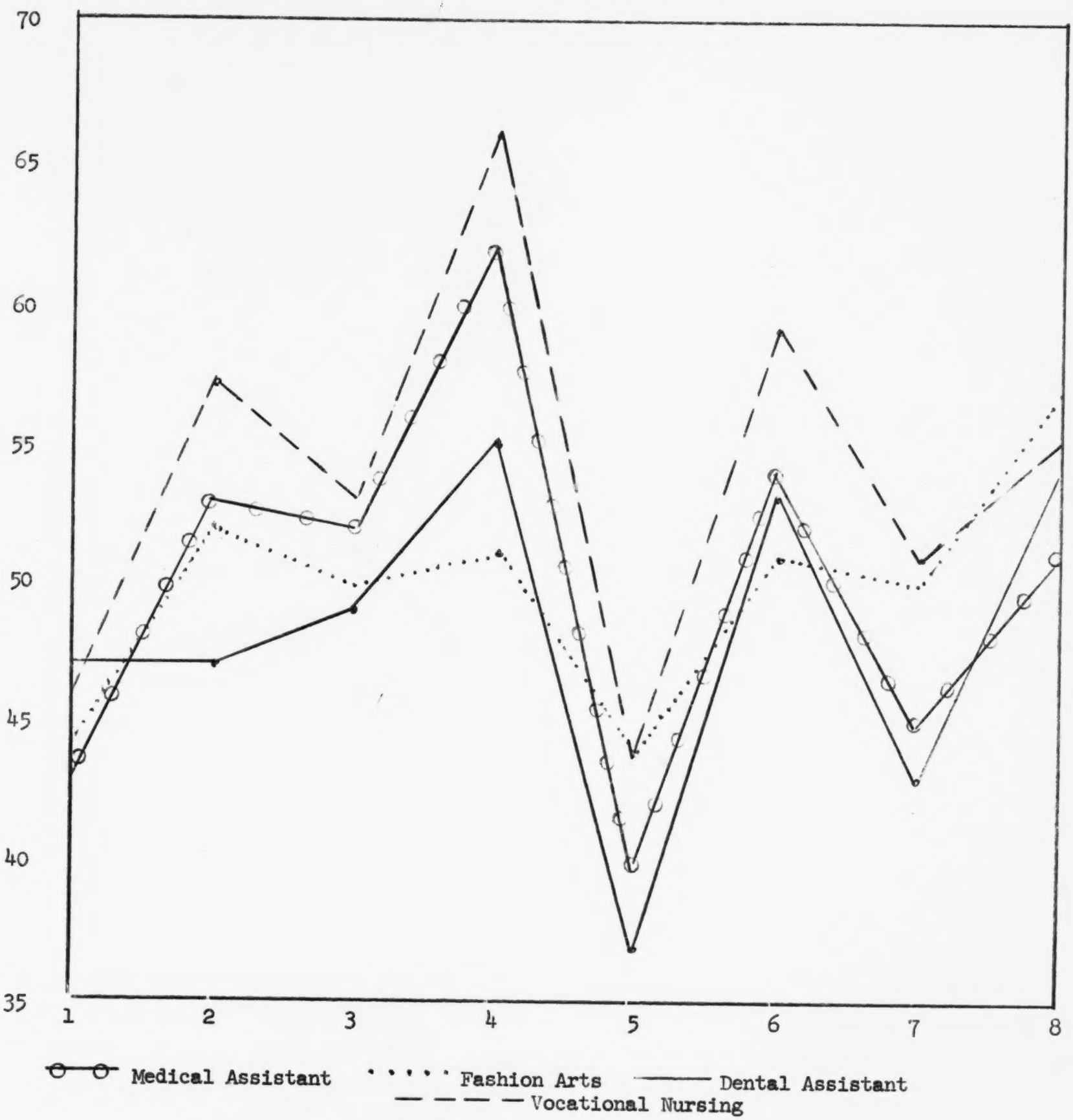

Fig. 4. Plots of mean vectors of IAS scores converted to standard scores for females grouped according to curriculum.

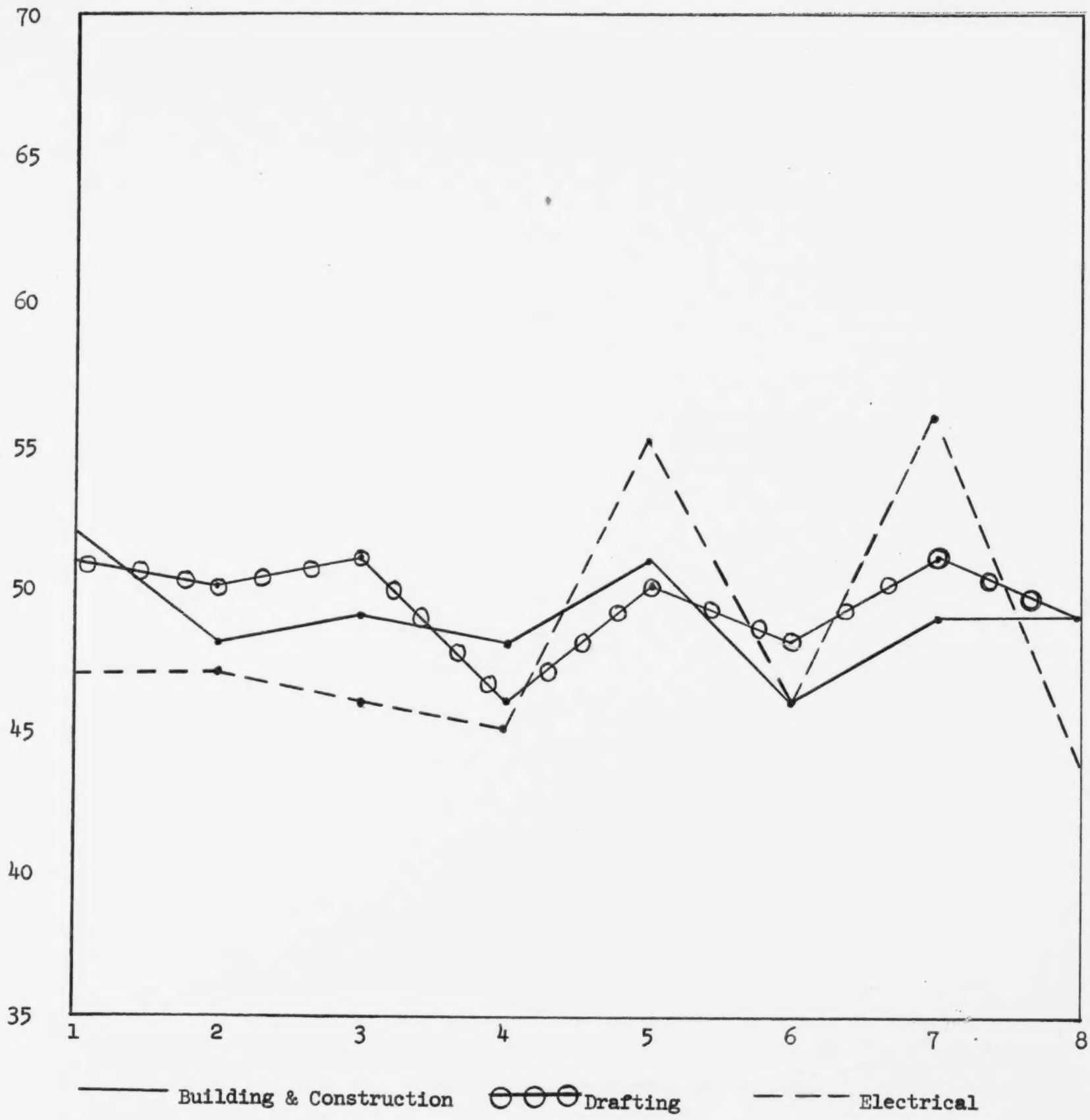

Fig. 5. Plots of mean vectors of IAS scores converted to standard scores for males in Building & Construction, Drafting, and Electrical curricula.

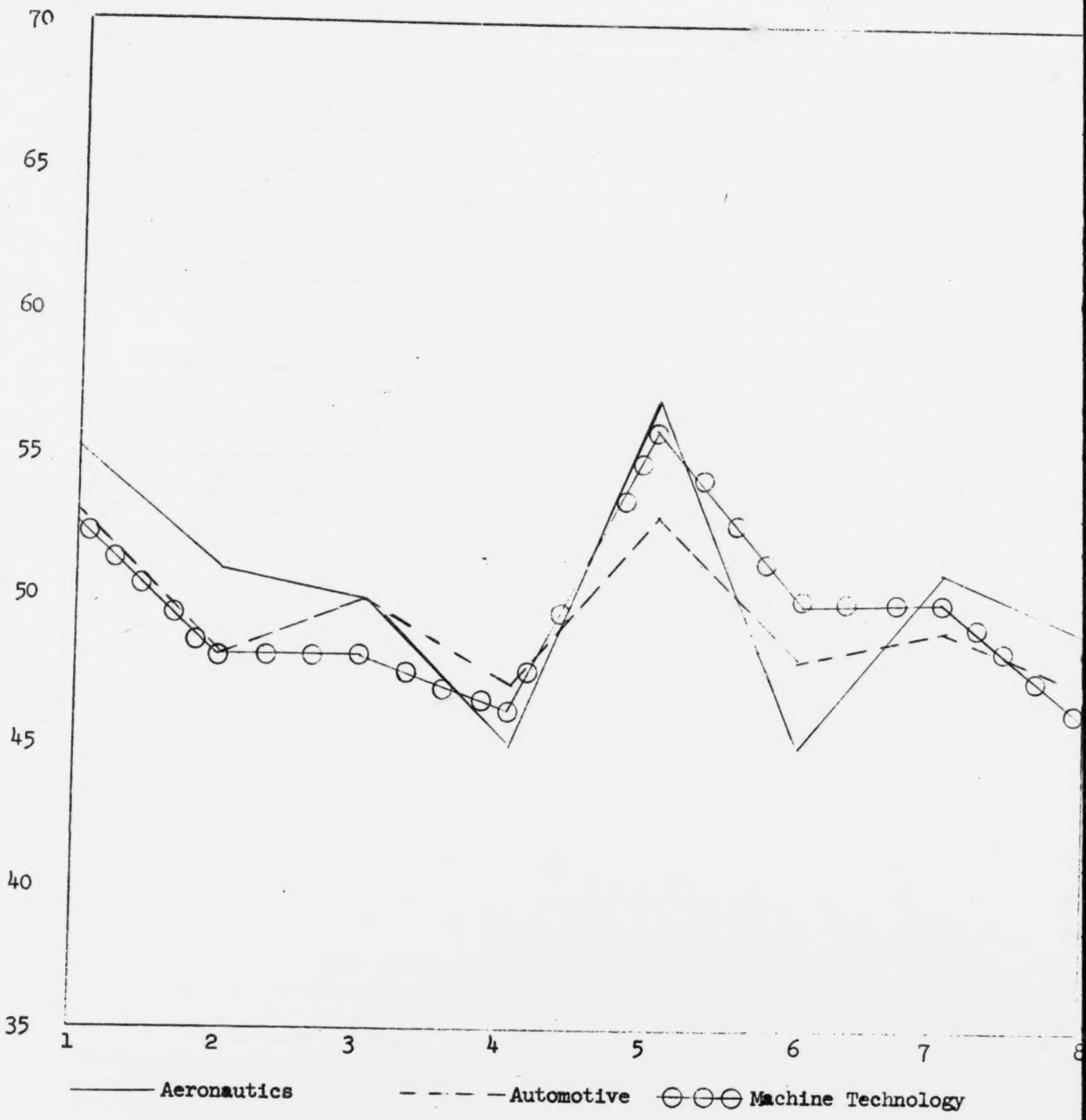

Fig. 6. Plots of mean vectors of IAS scores converted to standard scores for males in Aeronautics, Automotive, and Machine Technology curricula.

In terms of concurrent validity, the IAS scales appear to be quite satisfactory for these subjects. In the over-all analysis, the subtests differentiate sharply among the curriculum groups--both for males and for females.

Interrelationships Between OPI and IAS

Since both the OPI and IAS subtests differentiate the vocational curriculum groups, it may be unnecessary to use both instruments, particularly if they measure essentially the same psychological traits. The following analyses were carried out to determine the degree of overlap between subtests of the two instruments.

The intercorrelations between the two instruments are shown in Table 11. In general, the correlations tend to be rather low; however, because of the fairly large N's on which they are based, a number of them are significant. Canonical correlations were computed between the two sets of scores--the seven scales of the OPI and the eight subtests on the IAS. Canonical analysis provides a maximum correlation of linear composites, canonical variates, of the two sets of scores. The first canonical correlation indicates the maximum degree of relationship. The second canonical correlation indicates how the two sets of scores are next most highly related (independent of the first correlation), and so on.

The first three canonical correlations for males and for females are shown in Table 12.

In computing canonical correlations, the following sets of correlation matrices are used:

R_{AA}	R_{AB}
R_{BA}	R_{BB}

Where R_{AA} is the matrix of intercorrelations among one set of variables, for instance, the OPI scales;

R_{BB} is the matrix of intercorrelations between the scales of the other instrument;

R_{AB} is the matrix of the intercorrelations between the subscales of the two instruments; and

R_{BA} is the transpose of R_{AB}.

With each canonical correlation a vector of weights (a) is generated for R_{AA} and (b) for R_{BB}. By premultiplying R_{AA} by the transpose of its weight vector ($a'R_{AA}$) or ($b'R_{BB}$), correlations of each variable with the canonical variate can be obtained. These correlations can be interpreted as loadings on orthogonal factors.

If the canonical correlation is near 1.00, the loadings obtained from $a'R_{AA}$ and $b'R_{BB}$ can be superimposed on the same factor plot because the angle spanned by the linear composites is small.

TABLE 12

Canonical Correlations Between OPI and IAS

	Males (N=285)	Females (N=115)
1st Canonical Correlation	.69	.71
2nd Canonical Correlation	.58	.62
3rd Canonical Correlation	.50	.57

TABLE 13

Significant Correlations Between OPI Scales and IAS Subtests

IAS Subtests	OPI Males		OPI Females	
	Negative	Positive	Negative	Positive
Adventure	Au TI TO	IE		Co IE
Order	Au IE TI TO			
Influencing Others	Au Co IE SI	Es TI	SI	Es TI
Nurturance	Au Co IE SI	Es TI		TI
Concrete Means	Au Co Es IE SI	TO		TO
Written Expression	IE SI	Es TI TO		Es TI TO
Abstract Ideas	IE SI	Es TI TO		Co Es TI TO
Aesthetic	SI	Es TI TO	SI	Co Es IE TI

If the canonical correlation deviates greatly from 1.00, a more appropriate multiplication would be $a'R_{AA}$ and $a'R_{AB}$ (or $b'R_{BB}$ and $b'R_{BA}$), which would assure that the two sets of loadings have the same reference axes. The loadings can then be inspected to determine whether R_{AA} and R_{BB} have a similar underlying factor structure. For the following analyses the multiplication $a'R_{AA}$ and $a'R_{AB}$ were used.

Plots of the loadings for the first two canonical variates are shown in Figures 7 and 8. As one might expect from the low magnitude of correlations of OPI subtests with those of the IAS, the factor structure of the two instruments is somewhat dissimilar. Nevertheless, for males, Social Introversion (SI) and Impulse Expression (IE) share common factor space with Outdoor Interests; Autonomy (Au), Theoretical Orientation (TO) and Complexity (Co) with Influencing Others, Nurturance, Written Expression and Aesthetic; and Estheticism with Abstract. The relationships for females are not readily discernible.

The nature of relationships between the OPI and IAS subtests are further illustrated by the analysis of Pearson product-moment correlations in Table 13. The significant correlations of the OPI variables with each of the IAS subtests have been listed without regard to the magnitude of the correlation.

From the descriptions of the OPI scales, it can be seen that subjects high in Adventure tended to be judgmental and to lack realism in their action. They tended to prefer overt action, to evaluate ideas on the basis of their immediate application, and to take an uncritical approach to problems. Also, they tended to value sensations. In terms of OPI subtests, males high on Order were quite similar to those high in Adventure, except that the former tended to devalue sensations.

Students high on Influencing Others tended to be judgmental, to prefer simplicity, to devalue sensations and to seek social contacts. On the other hand, they seemed to show diverse interest in artistic matters and to engage in reflective thoughtof an abstract nature. Those students high in Nurturance tended to have the same pattern of scores on the OPI variables as those high on Influencing Others. With one exception, subjects high on Concrete Means tended to have the same pattern of OPI scores as did those high in Influencing Others and in Nurturance. Those high in Concrete Means tended to show little concern with activities of an artistic nature.

Subjects high on Written Expression, Abstract Ideas, and Aesthetic tended to have similar patterns on the OPI variables. They tended to value social contacts and not to value sensations. On the other hand, they tended to have diverse interests in artistic matters, to prefer reflective thought of an abstract nature, and to have a logical approach to problems. The only difference between these three groups was the lack of a significant correlation between Aesthetic and IE.

In the cases where there were significant correlations between OPI and IAS scores for women, the patterns of relationships tended to be quite similar to those for males. The small number of significant relationships for women is probably an artifact due to the

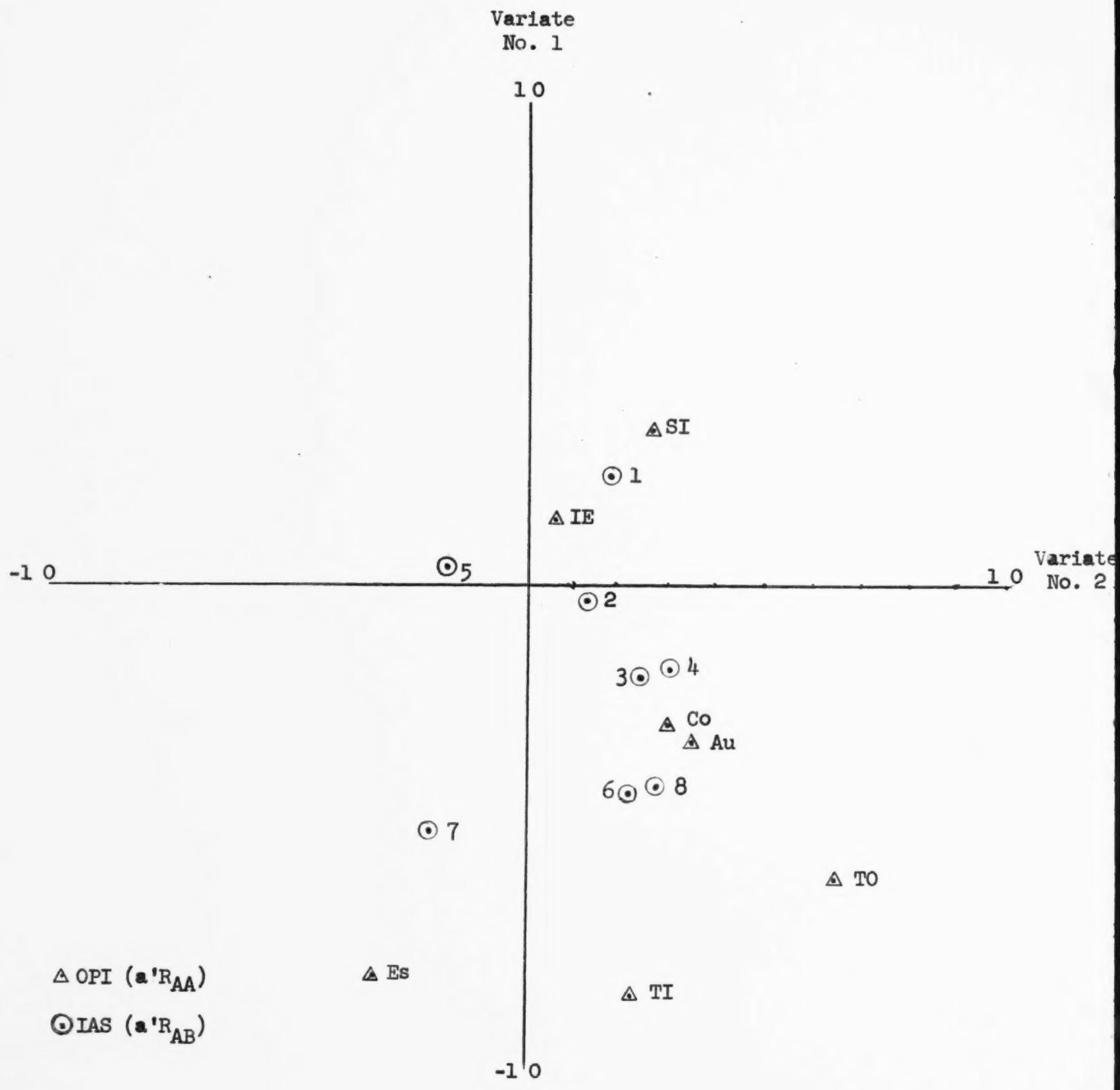

Fig 7. Plots of leadings for first two canonical variates for IAS and OPI scores for 285 males.

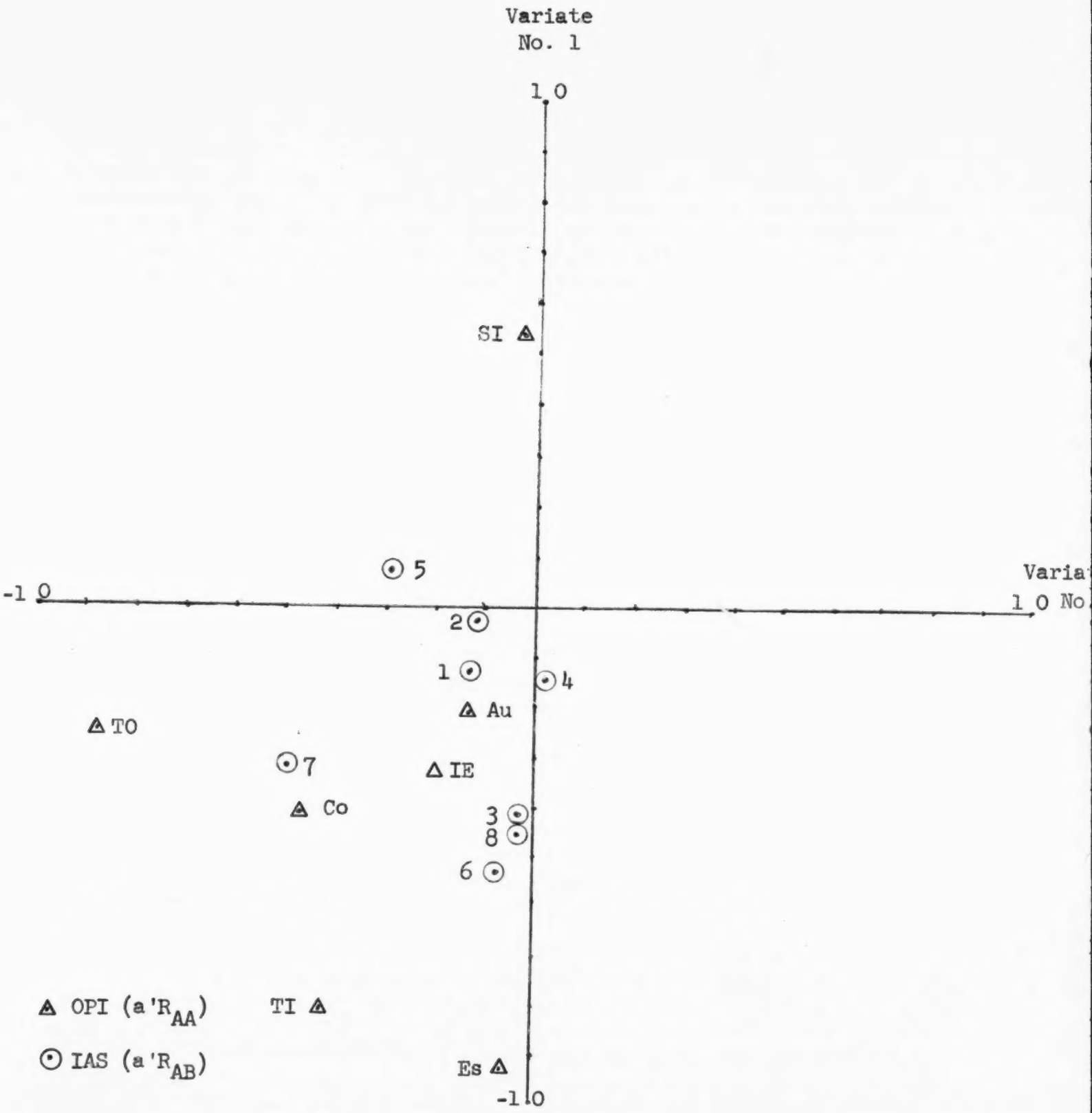

Fig. 8. Plots of loadings for first two canonical variates for IAS and OPI scores for 115 females.

smaller number of female subjects.

The preceding analysis helps to determine the meaning of the IAS scales. The relationship explains, in part, the overlap between the IAS subtests. However, as pointed out previously, the correlations among the subtests of the two instruments are very small. They do not have enough common variance to justify substituting one instrument for the other. Both instruments appear to have utility for describing students in vocational courses.

RISK-TAKING ATTITUDES

Risk-taking tendency might be assumed to be related to choice of curricula. Choosing a curriculum in a four-year institution requires planning for distant and often poorly defined goals. The choice may involve a considerable degree of risk-taking on the part of the student. Frequently a student enteres a four-year program of study with little certainty about his field of concentration or his job opportunities after he has obtained his degree. In contrast, it may be presumed that the vocational student enters the junior college with goals which are not only definite but which can be attained within a relatively shorter period of time. He enters training to become a carpenter, an electronic technician, or the like. The perceived risk to the vocational student would seem to be relatively less than that of the university student. The validity of this assumption, however, still remains to be established.

The following analyses bear on the above assumption only indirectly. No basis for comparing the risk preference of vocational students with those entering four-year colleges was available to the investigator. However, the risk preferences of this study sample can be related to other study variables found to be associated with choice of vocational-oriented curricula.

Subjects were asked to complete the following items dealing with preference for certain aspects of jobs:

For the pairs of items below, check the one in <u>each</u> case you would rather do.

(a) 1___ Take a job with a new company where promotion might be quick, but where there is some risk of losing the job
<u>or</u>
2___ Take a secure job with an old company where promotion is uncertain

(b) 1___ Stay in your home town even if jobs are scarce
<u>or</u>
2___ Leave your home town, family, and friends for a sure job in a different town

(c) 1___ Have a job in which you are told everything to do
<u>or</u>
2___ Have a job in which you decide what to do with only some help from your foreman or boss when you need it

(d) 1___Take a job where others compete with you but where rewards are great if you succeed
or
2___Take a job in which the rewards do not depend upon competition.

Each of the four items was scored a "1" for the choice involving the least risk; "2" for the one involving most risk. A person's score on the items could range from 4 to 8. Essentially, this procedure provided an index of consistency for risk preference rather than an index of degree of risk preference.

The scores on the study instruments for male subjects, grouped according to their consistency score on the preference for risk items, were analyzed by means of Multivariate Analysis of Variance (MANOV). These analyses are shown in Table 14. The obtained F ratios for H_1 provided no evidence for questioning the assumption that the factor structure underlying the scores on the several scales varied among the risk groups; that is, the F ratios for H_1 were not significant. On the other hand, the mean profiles of IAS and OPI scores were significantly different for the various groups. It appears that students who consistently preferred high risk situations were high on the Adventure, Influencing Others, and Abstract Ideas, subtests of the IAS. Also, they tended to have rather high scores on the AU and TI scales of the OPI.

As shown in Table 15, the trends for females were somewhat different from those observed for males. Only the subscales of the OPI differentiated the risk preference groups. Subjects who consistently indicated a high risk preference tended to have high scores on AU, TI, and TO. The major differences among the risk preference groups on the IAS and OPI scales can be seen more readily in Figures 9, 10, 11.

Still further information was obtained relative to risk preference. Subjects were asked to complete the following question:

If you had your choice, which of the following kinds of jobs would you pick? (check one)

(1) ____ a job which doesn't pay much money but which you were sure of keeping

(2) ____ a job which pays good money but which you have a 50-50 chance of not being able to hold

(3) ____ a job which pays real good money if you can keep it but one in which you lose almost everything if you don't make it.

The scores on the study instruments, grouped according to responses to the three choices, were analyzed by means of MANOV. The results are shown in Tables 16 and 17. Only the mean vectors of scores on the OPI subtests were significantly different for both males and females. The nature of the differences on the OPI subtests can be seen in Figures 12 and 13.

TABLE 14

MANOV of Profile of Mean Scores for Males Classified According to Consistency of Risk Preference

		Score on Risk Preference Items			
		4-5 (N=15)	6 (N=74)	7 (N=93)	8 (N=89)
IAS	1	48	57	57	55
	2	40	40	39	38
	3	34	41	47	43
	4	39	44	44	43
	5	53	57	57	59
	6	27	32	33	35
	7	41	47	49	52
	8	44	44	46	44
		$H_1 : F^{108}_{9053} = .123$	$p > .05$		
		$H_2 : F^{24}_{755} = 2.422$	$p < .01$		
OPI	Au	19	16	18	22
	Co	12	11	12	12
	Es	6	7	8	9
	IE	32	32	32	34
	SI	28	27	25	26
	TI	24	24	26	30
	TO	17	16	17	19
		$H_1 : F^{84}_{9188} = .281$	$p > .05$		
		$H_2 : F^{21}_{750} = 4.839$	$p < .01$		

TABLE 15

MANOV of Profile of Mean Scores for Females Classified According to Consistency of Risk Preference

		Score on Risk Preference Items			
		4-5 (N=20)	6 (N=38)	7 (N=30)	8 (N=19)
IAS	1	48	50	49	51
	2	44	40	37	41
	3	44	43	44	45
	4	58	58	54	58
	5	44	38	40	40
	6	37	40	41	44
	7	39	41	44	48
	8	52	52	57	57
		$H_1 : F^{108} = .07$	$p > .05$		
		$H_2 : F^{24}_{279} = 1.184$	$p > .05$		
OPI	Au	16	18	18	21
	Co	9	11	12	13
	Es	9	11	12	13
	IE	24	27	29	30
	SI	26	22	20	23
	TI	24	29	31	33
	TO	13	14	16	17
		$H_1 : F^{84} = .138$	$p > .05$		
		$H_2 : F^{21}_{279} = 3.448$	$p < .01$		

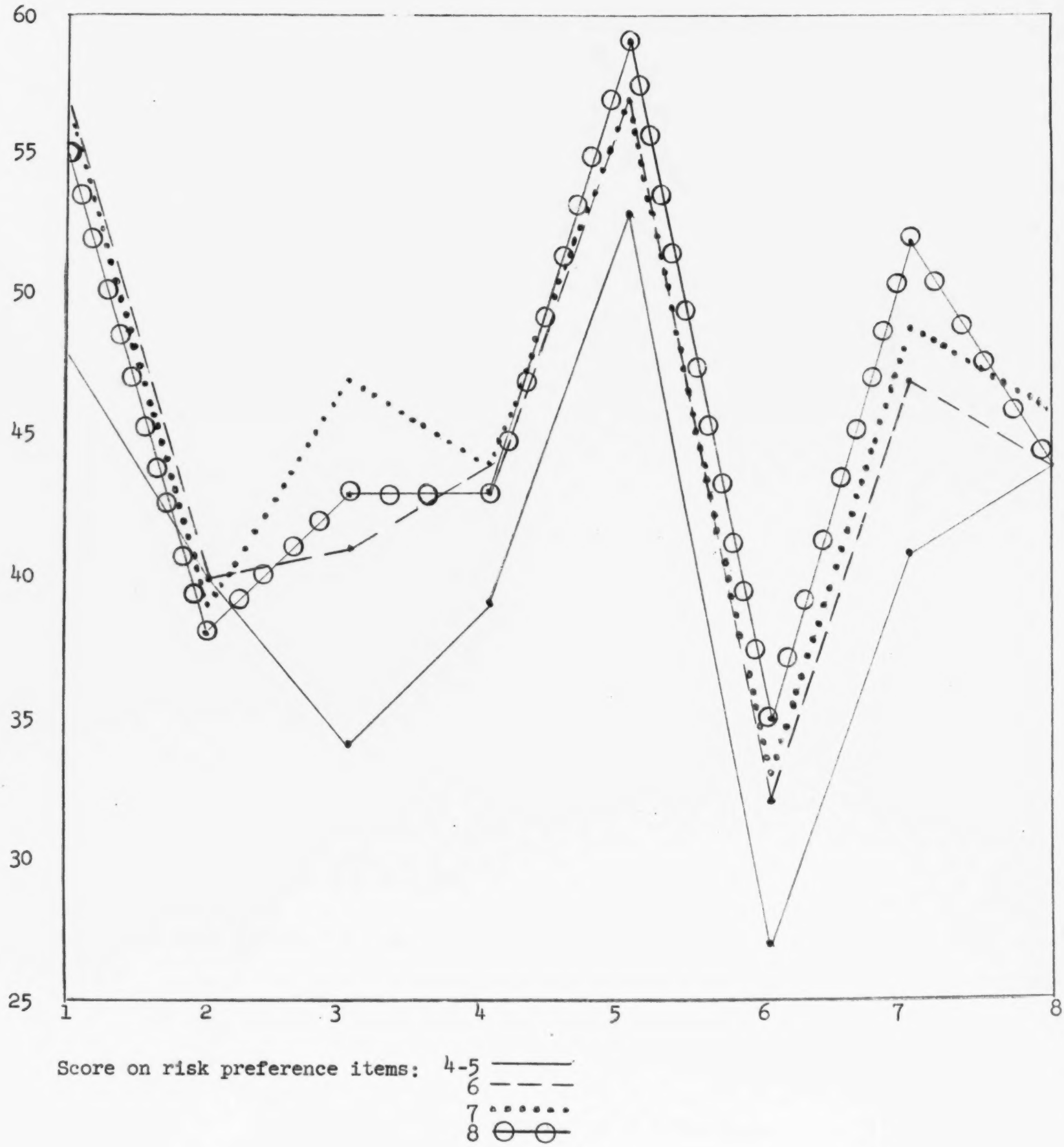

Fig. 9. Plots of mean vectors of IAS scores for male subjects classified according to consistency of risk preference.

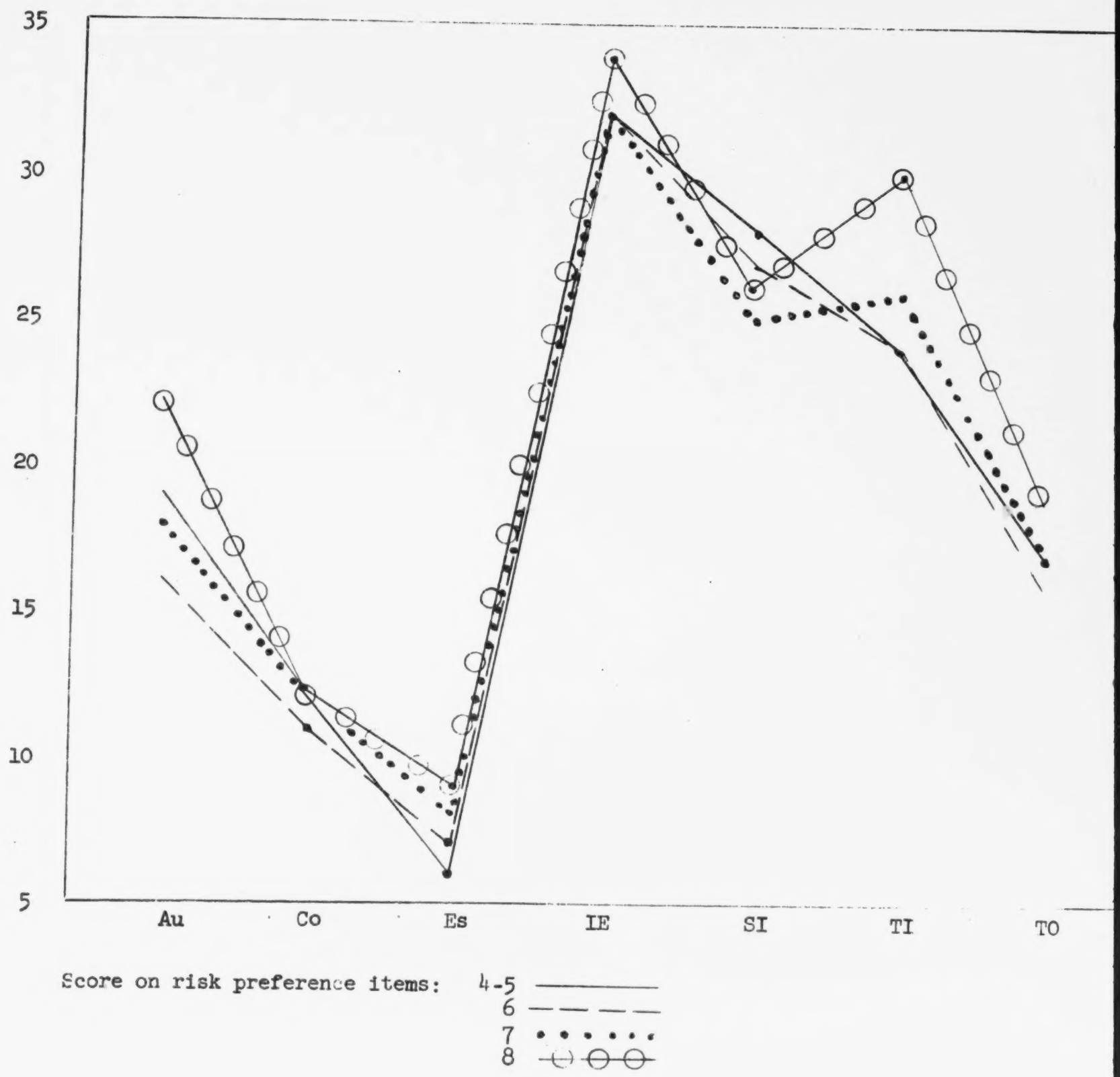

Fig. 10. Plots of mean vectors of OPI scores for male subjects classified according to consistency of risk preference.

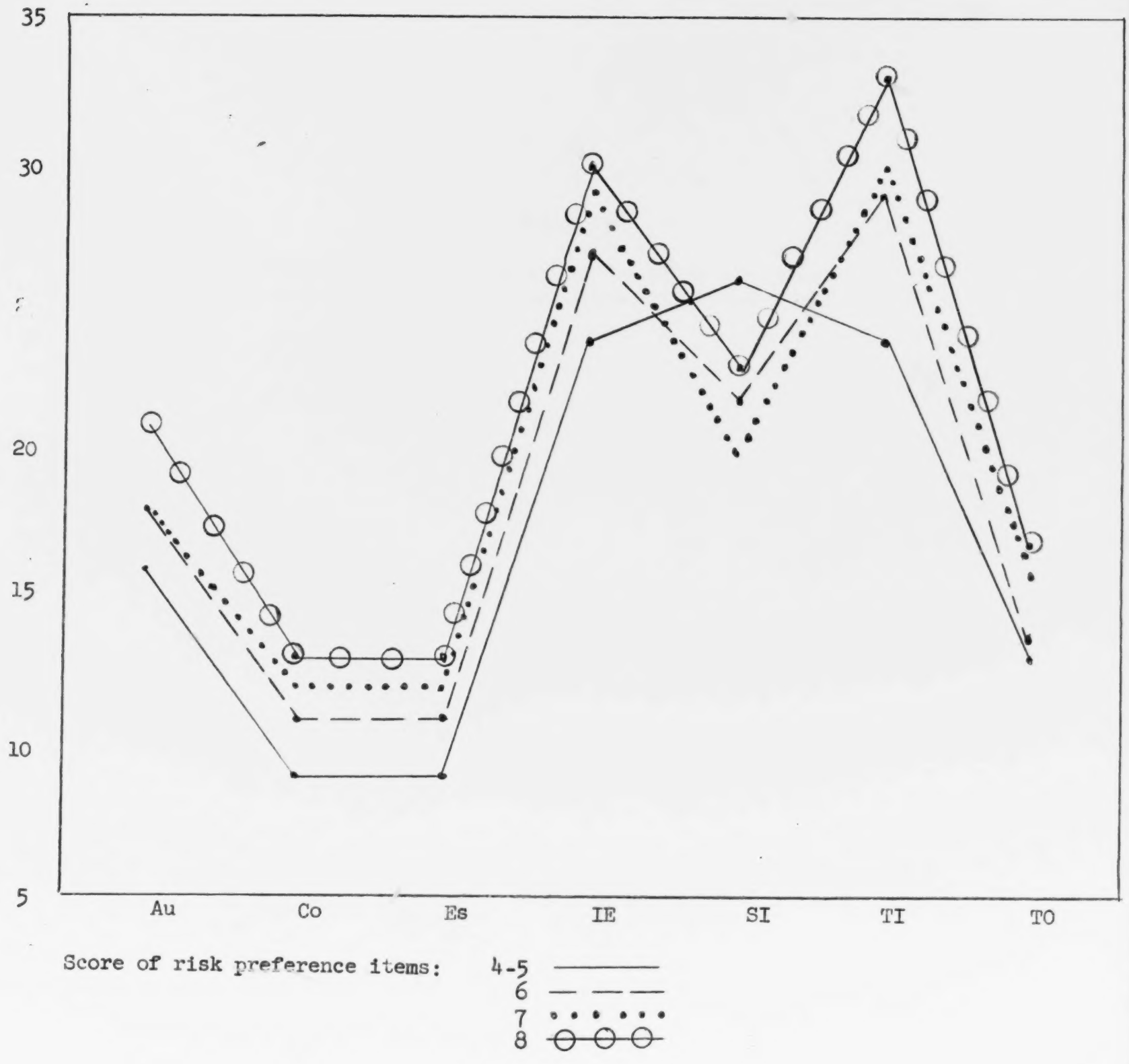

Fig. 11. Plots of mean vectors of OPI scores for female subjects classified according to consistency of risk preference.

TABLE 16

MANOV of Mean Vectors of Scores of Males Classified According to Degree of Risk Preference in Job

		Low Pay, High Security (N=99)	Moderate Pay, Moderate Security (N=101)	High Pay, Low Security (N=80)
IAS	1	56	55	57
	2	40	40	37
	3	42	44	44
	4	44	44	42
	5	58	56	57
	6	33	34	33
	7	47	49	51
	8	46	45	43
		$H_1 : F \frac{72}{\infty} = .121$	$p > .05$	
		$H_2 : F \frac{16}{540} = 1.191$	$p > .05$	
OPI	Au	17	19	21
	Co	11	12	13
	Es	7	8	9
	IE	31	32	35
	SI	26	26	26
	TI	25	27	29
	TO	16	18	19
		$H_1 : F \frac{56}{\infty} = .283$	$p > .05$	
		$H_2 : F \frac{14}{542} = 5.627$	$p < .01$	

TABLE 17

MANOV of Mean Vectors of Scores of Females Classified According to Degree of Risk Preference in Job

		Low Pay, High Security (N=72)	Moderate Pay, Moderate Security (N=28)	High Pay, Low Security (N=13)
IAS	1	48	49	56
	2	40	42	40
	3	43	44	48
	4	57	57	57
	5	38	42	41
	6	39	43	46
	7	41	47	43
	8	52	55	60
		$H_1 : F^{72}_{4008} = .093$	$p > .05$	
		$H_2 : F^{16}_{206} = 1.452$	$p > .05$	
OPI	Au	17	18	21
	Co	11	11	13
	Es	11	12	14
	IE	27	28	29
	SI	23	24	21
	TI	28	31	32
	TO	14	15	17
		$H_1 : F^{56}_{4085} = .131$	$p > .05$	
		$H_2 : F^{14}_{208} = 1.832$	$.05 > p > .01$	

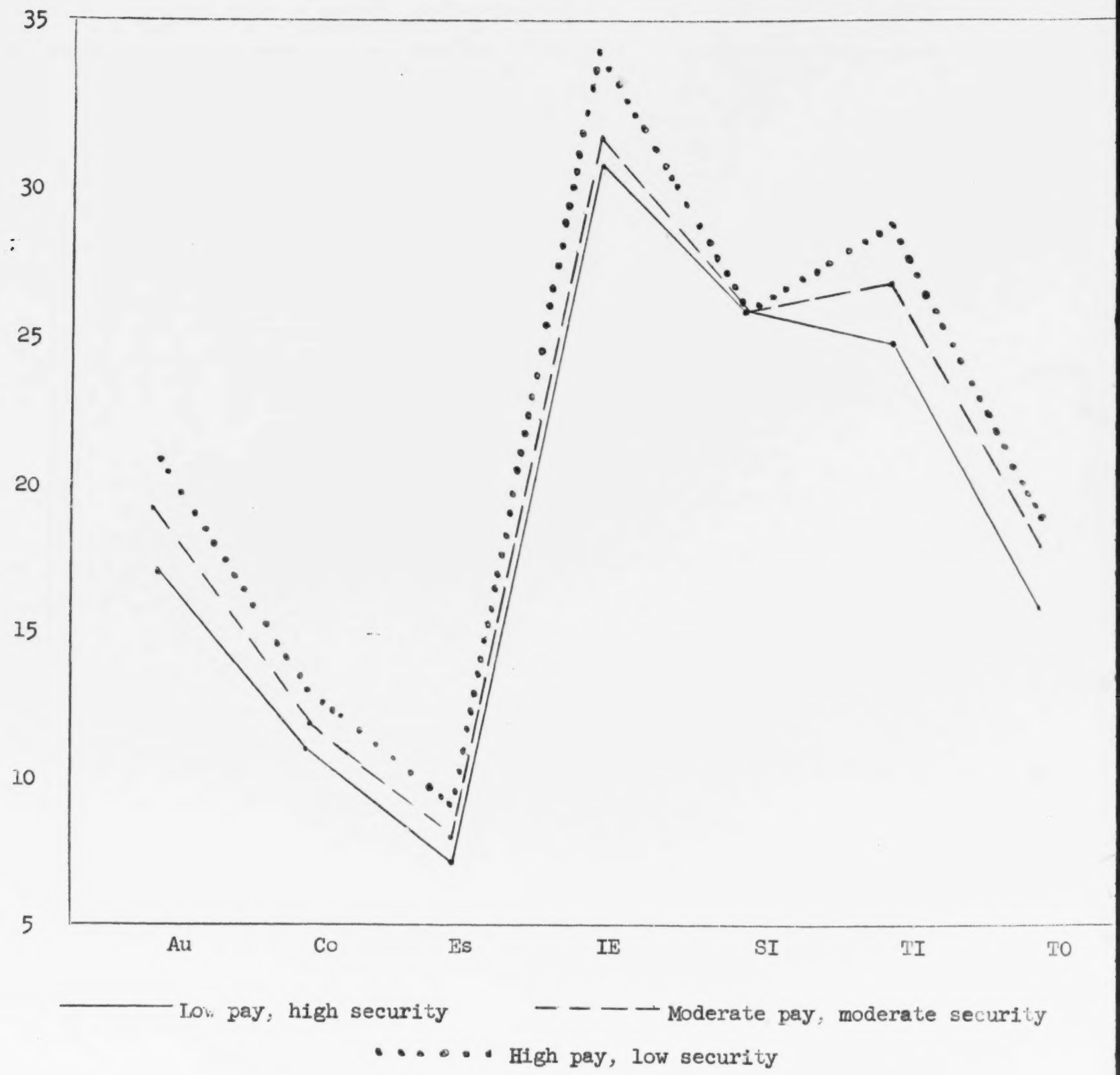

Fig. 12. Plots of mean vectors of OPI scores for male subjects classified according to degree of risk preference in jobs.

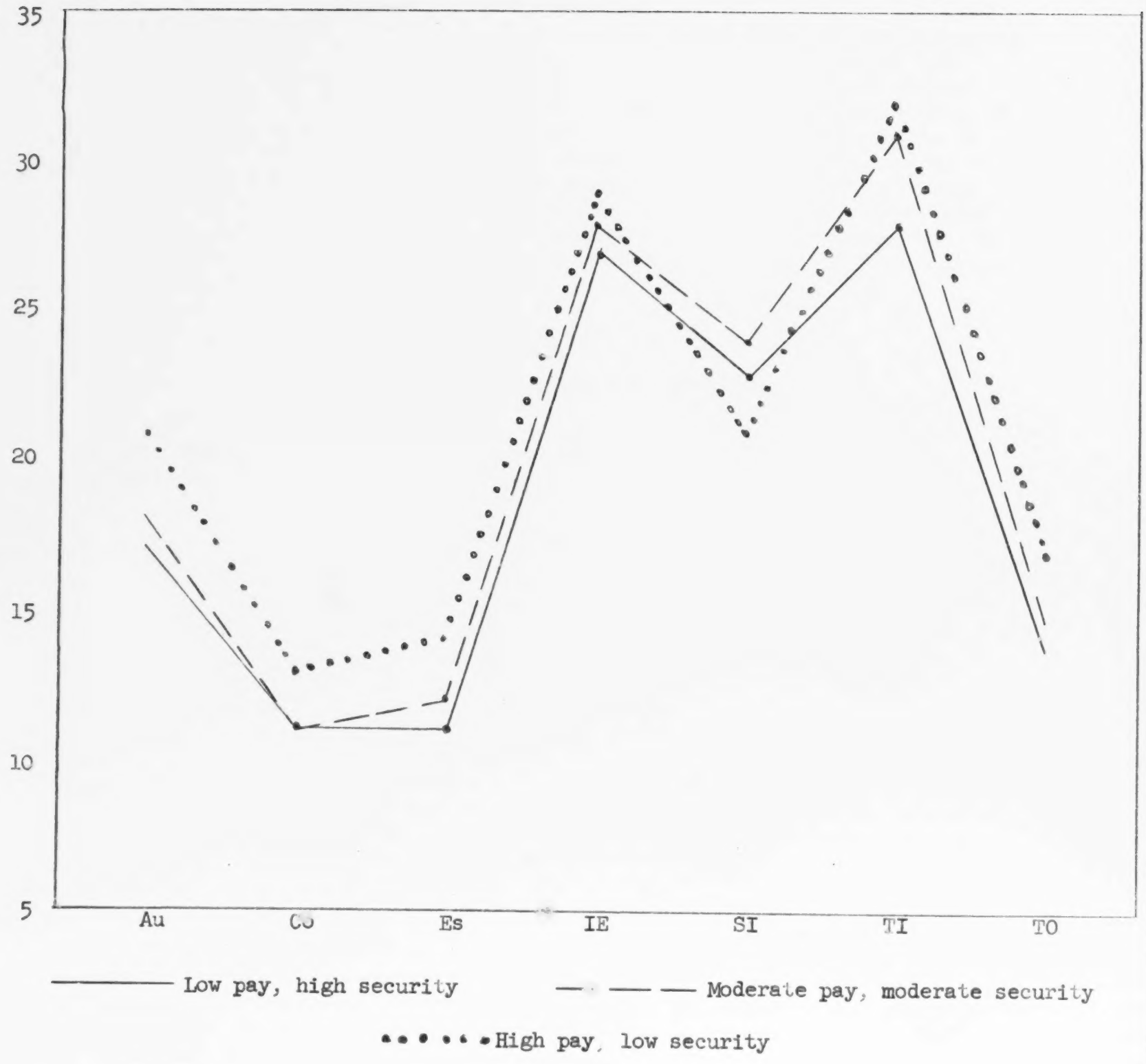

Fig. 13. Plots of mean vectors of OPI scores for female subjects classified according to degree of risk preference in jobs.

Sex differences with respect to the proportion of subjects responding to the three choices should be noted. Females, predominantly, tended to prefer the job which they were sure of keeping, i.e., low risk. The responses of males, on the other hand, were spread fairly evenly over the three choices. The meaning of these sex differences is not readily apparent. The differences could be simply reflections of the fact that women may perceive a ready source of steady income as a realistic consideration in view of possible future plans for marriage and family. However, in view of the previously discussed relationship of the curriculum choices of these subjects with certain personality and interest factors, it is difficult to accept this as the only explanation for the sex differences.

SOURCES OF EXPECTED LIFE SATISFACTION

Subjects were asked to complete the following question: What three activities in your life do you expect to give you the most satisfaction? Please write a . . .

"1" next to the most important
"2" next to the second most important
"3" next to the third most important
"4" next to the least important

(1) ____ Occupation or job
(2) ____ Making money
(3) ____ Marriage and family life
(4) ____ Leisure time play activities; hobbies, outdoor living, sports
(5) ____ Religious activities
(6) ____ Taking part in affairs of your community
(7) ____ Taking part in activities directed toward making world conditions better
(8) ____ Literature, art, or music
(9) ____ Other; tell what: _____

Only the first choices of most important sources of satisfaction were taken into consideration in the following analyses. The scores on the various tests used in the study, grouped according to the most important source of life's satisfaction checked by the subjects, were analyzed by means of MANOV. The results are shown in Tables 18 and 19. Only responses 1 through 5 were checked by a sufficiently large number of males to justify including them in the analyses, whereas only responses 1 and 3 were checked in sufficient number by the females.

The five groups of males were clearly differentiated by the IAS scores. The F ratio for the OPI scales was in the doubtful zone of significance ($.05 > p > .01$).

The plots of mean IAS scores in Figure 14 show that subjects who expected to receive most life satisfaction through their job tended to be low in Adventure and Nurturance; they were relatively high in Concrete Means. Those who felt making money was important were low in Adventure, Nurturance, Concrete Means, Abstract Ideas, and Aesthetic.

TABLE 18

MANOV of Mean Vectors of Scores of Males Grouped According to Perceived Sources of Life Satisfaction

		Job (N=77)	Money (N=23)	Marriage & Family (N=121)	Leisure Time (N=21)	Religious Activities (N=13)
IAS	1	54	53	56	59	58
	2	40	40	39	32	43
	3	43	40	44	35	47
	4	43	38	44	38	50
	5	60	51	57	55	59
	6	34	33	31	33	38
	7	49	46	48	50	50
	8	45	41	45	45	49
		$H_1 : F\ {}^{144}_{9477} = .130$		$p > .05$		
		$H_2 : F\ {}^{32}_{898} = 2.025$		$p < .01$		
OPI	Au	20	20	18	21	15
	Co	12	12	12	14	11
	Es	7	7	8	8	9
	IE	32	35	33	39	28
	SI	26	29	26	28	22
	TI	27	25	27	26	27
	TO	18	17	17	18	15
		$H_1 : F\ {}^{112}_{9615} = .182$		$p > .05$		
		$H_2 : F\ {}^{28}_{881} = 1.660$		$.05 > p > .01$		

TABLE 19

MANOV of Profiles of Mean Scores of Females Grouped According to Perceived Sources of Life Satisfaction

		Job (N=16)	Marriage and Family (N=69)
IAS	1	52	48
	2	45	39
	3	46	43
	4	53	57
	5	43	38
	6	41	39
	7	45	41
	8	57	53

$H_1 : F \frac{36}{2516} = .471$ $p > .05$

$H_2 : F \frac{8}{76} = 1.847$ $p > .05$

OPI	Au	16	18
	Co	12	11
	Es	13	10
	IE	26	27
	SI	20	23
	TI	30	27
	TO	16	14

$H_1 : F \frac{28}{2587} = .165$ $p > .05$

$H_2 : F \frac{7}{77} = 1.696$ $p > .05$

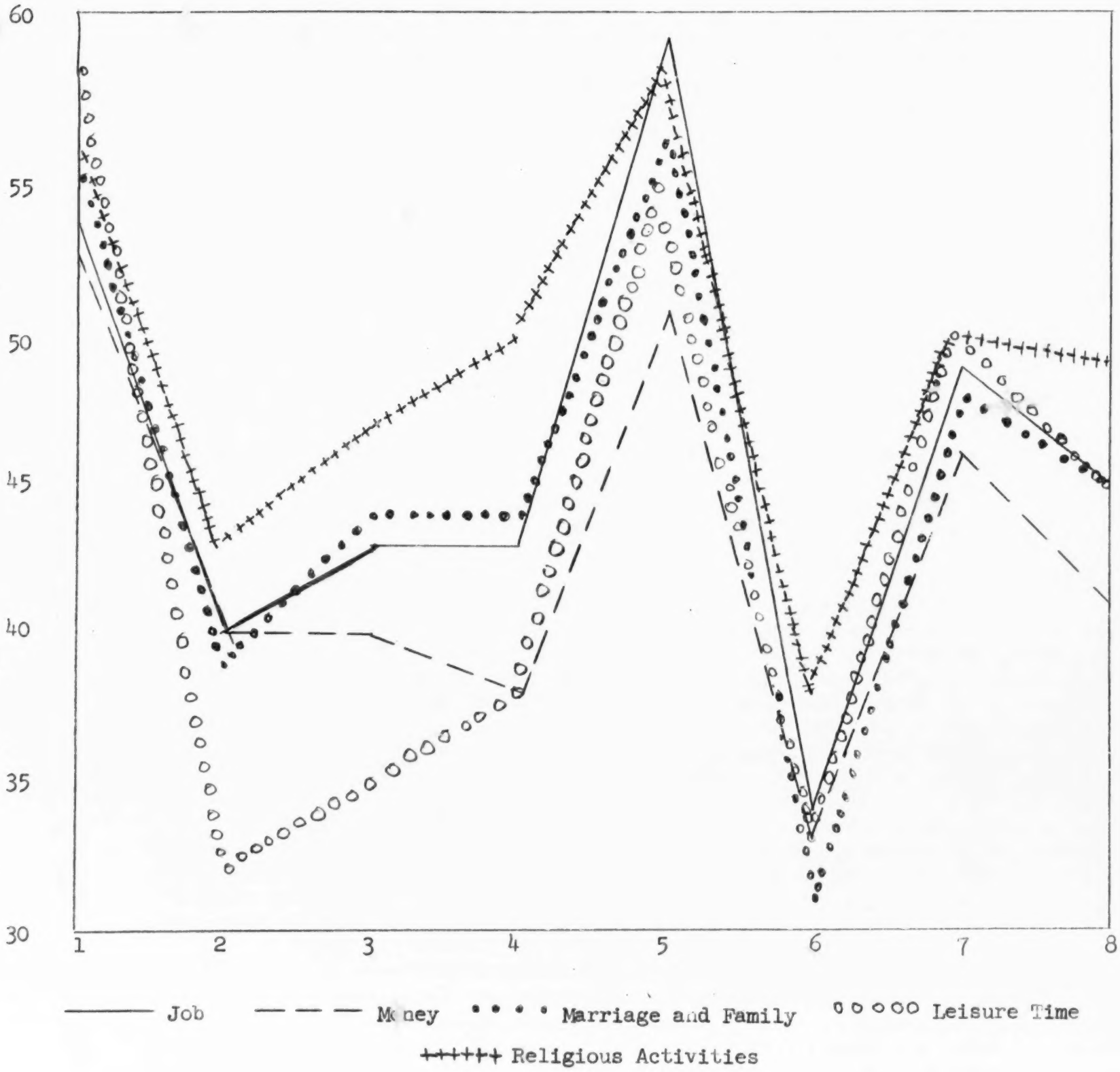

Fig. 14. Plots of mean vectors of IAS scores for male subjects classified according to perceived source of life satisfaction.

Subjects who perceived marriage and family life as the major source of life satisfaction were relatively low in Written Expression and high in Concrete Means. Those who expected to receive most satisfaction from leisure activities were high in Adventure and Abstract Ideas and low in Detail, Influencing Others and Nurturance. Finally subjects who expected life satisfaction to be obtained through religious activities tended to be high on all the IAS subtests.

The differences on the OPI variables for males can be noted in Figure 15. The findings for females are shown in Table 19. None of the study instruments differentiated the females who expected to receive major life satisfactions from their jobs from those who expected major satisfaction from marriage and family life.

IMPLICATIONS OF THE FINDINGS

As pointed out earlier in this report, this study was limited to a sample of students in one college. At the present time there is little evidence available to determine whether the sample is similar to students in vocationally oriented curricula in other institutions. But for the study sample, the following general conclusions appear to be warranted:

1. Junior college students in the vocationally oriented curricula were different with respect to the study variables from those junior college students who were in non-vocational programs and from student populations in four-year colleges and universities. Direct comparisons on the IAS scores were possible between study sample and a large sample from another junior college located in the San Francisco Bay Area. The means of the two samples on the subtests of the IAS were clearly different.

Differences between the study sample and other student samples on the OPI subscales can be inferred only from a comparison of published norms with the mean scores of the study sample, which indicates that scores of vocational students do differ significantly from other student samples.

From available comparisons, it seems reasonable to conclude that there are meaningful psychological factors which are related to the choice of a vocational program in a junior college -- that vocational students are not simply an aggregate of individuals who have been "dumped" into vocational programs because they were unsuccessful in other courses or because they were somehow judged unable to complete an academic course of study.

2. There were significant sex differences in scores on the study variables. While the factor structure, particularly for the OPI and IAS, was not significantly different for the sexes, differences between their mean vectors of scores were highly significant. As a result the data were analyzed separately by sex.

In general, findings were more clear-cut for males than for females. Still, the females were differentiated by a number of the variables. That the findings were less clear-cut for females

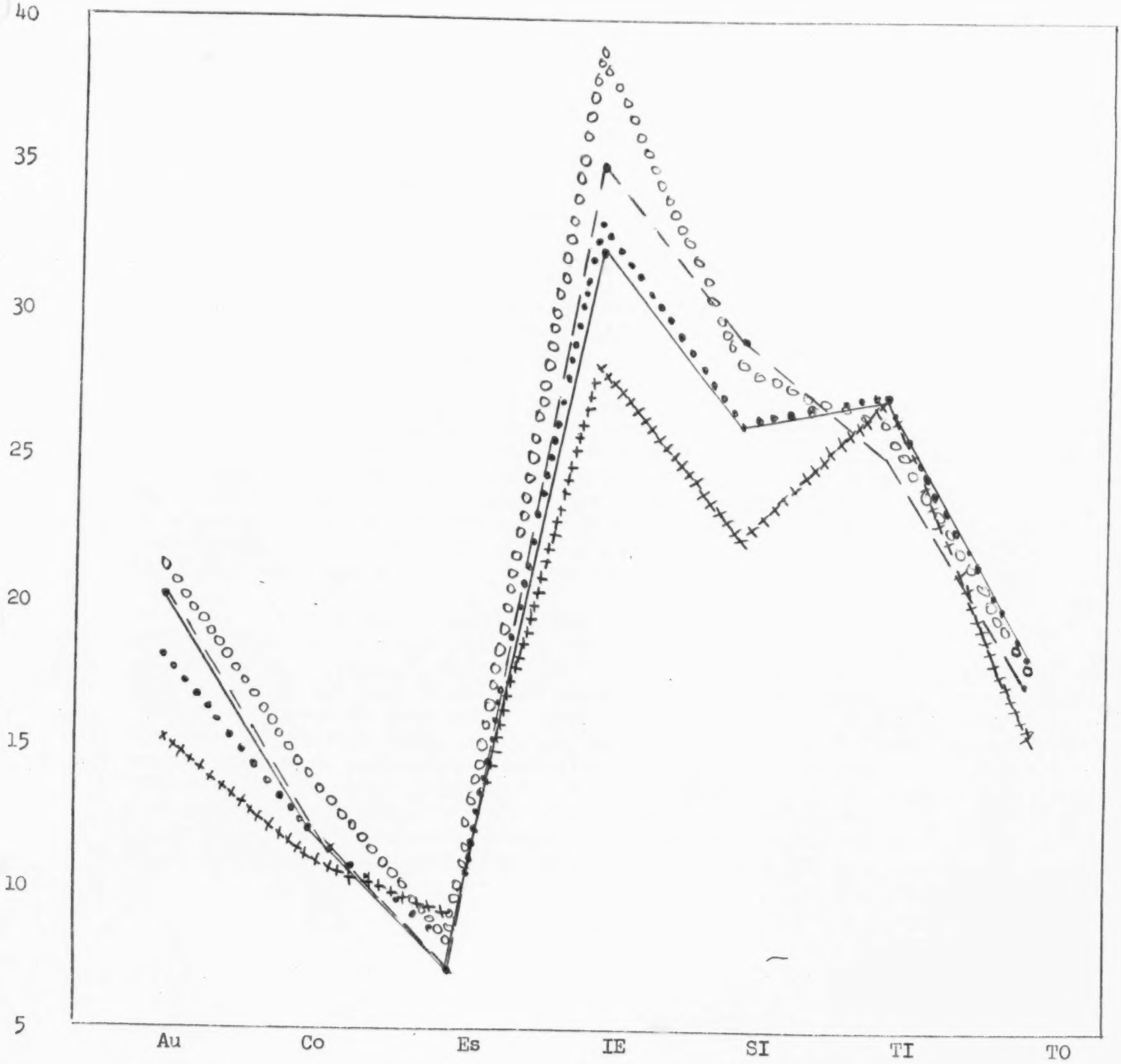

Fig. 15. Plots of mean vectors of OPI scores for male subjects classified according to perceived source of life satisfaction.

could have been anticipated in view of extremely complex factors involved in occupational choice for women.

3. Furthermore, there were significant variations in patterns of scores on the IAS and OPI among the students enrolled in the various vocational curricula. This finding held for both sexes. The students were most clearly differentiated by scores on the IAS; the differences in vectors of mean scores on the OPI were in the doubtful zone of significance ($.01 < p < .05$).

4. A number of scales on the OPI were significantly related to academic performance. However, these are correlated with tests of academic ability. Thus it appears that the IAS and the OPI will add little to the customary tests of academic ability in predicting grade point average.

The findings of this study have theoretical significance for the theory of vocational choice in that they indicate the importance of non-cognitive factors in the process of choosing a vocational curriculum. When the students are not screened by the institution, they do tend to choose a particular curriculum in terms of their interests and certain other personality factors. Further study needs to be carried out to determine the extent to which these non-cognitive factors influence the curriculum choice process.

From a practical standpoint, the findings indicate that non-cognitive factors must be taken into account by counselors in discussing with students their choice of vocational curriculum. This is not to say that counselors should begin placing students in various curricula according to their scores on the IAS and OPI: the data are far too inconclusive for that kind of procedure. But even if data were conclusive, channeling students, at any level, into programs of study according to their test scores is a questionable counseling strategy. On the other hand, knowledge of the characteristics of students who typically enter certain fields of study should be of interest to an individual in making his own choice.